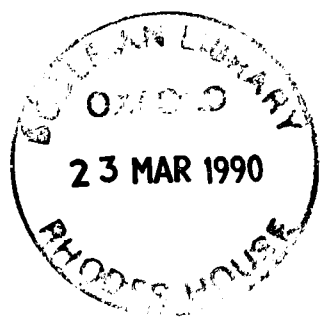
FOOD INSECURITY AND THE SOCIAL DIVISION OF LABOUR IN TANZANIA, 1919-1985





by

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TABLE 2.1.1: POPULATION AND INTER-CENSAL GROWTH RATES BY REGION, 1931-1978

Region	1978 Total	PGR[2]	1967 Total	PGR	1957 Total	PGR	1948 Total	PGR	1931 Total	PGR	1921[1] Total
Arusha	926,223	3.9	610,474	4.1	407,483	2.6	324,606	3.5	181,871		
Coast	516,586	1.0	511,506	2.3	408,270	1.0	385,584	1.9	281,495		
DSM	843,090	10.8	272,515	7.8	128,742	7.1	69,277	4.2	34,300		
Dodoma	972,005	2.9	709,380	3.3	514,425	1.1	466,199	2.9	287,658		
Iringa	925,044	2.7	689,905	3.5	489,291	2.6	389,248	3.6	213,108		
Kagera	1,009,767	4.0	658,712	2.5	514,431	1.3	456,396	1.1	378,686		
Kigoma	648,941	2.9	473,443	2.2	382,505	0.7	360,603	3.1	216,281		
Kilimanjaro	902,437	3.0	652,722	3.3	473,859	3.3	353,483	2.7	223,908		
Lindi	527,624	2.1	419,853	2.7	323,019	0.3	314,783	2.4	211,122		
Mara	723,827	2.6	544,125	4.6	347,587	3.4	258,123	2.0	184,291		
Mbeya	1,079,864	3.3	753,765	3.4	540,978	1.8	460,212	0.9	398,156		
Morogoro	939,264	2.9	685,104	2.3	547,558	1.5	477,985	2.4	318,966		
Mtwara	771,818	2.0	621,293	3.9	424,213	1.7	365,644	4.5	171,767		
Mwanza	1,443,379	2.9	1,055,883	2.4	836,341	2.3	680,252	2.4	456,578		
Rukwa	451,897	4.6	276,091	3.5	195,698	3.3	146,248	3.7	78,692		
Ruvuma	561,575	3.3	393,043	3.9	267,033	1.3	237,221	2.3	162,449		
Shinyanga	1,323,535	3.6	899,468	3.1	660,441	1.9	559,939	1.3	452,014		
Singida	613,949	2.7	457,938	2.1	372,537	0.5	354,948	4.2	176,836		
Tabora	817,907	4.5	502,068	3.0	371,820	0.8	345,196	0.3	330,128		
Tanga	1,037,767	2.7	771,060	2.9	579,382	2.3	471,456	2.6	305,354		
TOTAL	17,036,499	3.3	11,958,348	3.1	8,785,613	1.8	7,477,673	2.3	5,063,660	2.1	4,124,438

[1] It is impossible to construct a regional breakdown.
[2] 'PGR' population growth rate

TABLE 2.1.2: POPULATION AND INTER-CENSAL GROWTH RATES OF RURAL AREAS BY REGION, 1931-1978

Region	1978 Total	PGR	1967 Total	PGR	1957 Total	PGR	1948 Total	PGR	1931 Total	PGR	1921 Total
Arusha	871,000	3.8	578,462	3.8	397,445	2.5	319,286	3.4	181,871		
Coast	516,586	0.1	511,506	2.3	408,270	0.6	385,584	1.9	281,495		
DSM	73,645										
Dodoma	926,198	2.8	685,940	3.2	500,990	1.0	456,785	2.8	287,658		
Iringa	867,880	2.4	668,461	3.4	479,704	2.5	383,546	3.5	213,108		
Kagera	988,220	3.8	658,712	2.6	509,134	1.3	453,149	1.1	378,686		
Kigoma	598,866	2.6	452,395	2.1	366,250	0.2	360,603	3.1	216,281		
Kilimanjaro	850,391	2.8	626,110	3.1	460,133	3.2	345,435	2.6	223,908		
Lindi	500,312	1.6	419,853	3.0	312,700	0.2	306,206	2.2	211,122		
Mara	692,776	2.5	528,829	4.5	340,380	3.3	255,161	1.9	184,291		
Mbeya	1,003,263	2.6	753,765	3.5	534,046	1.7	457,033	0.8	398,156		
Morogoro	878,482	2.6	660,007	2.2	533,051	1.4	469,812	2.3	318,966		
Mtwara	723,327	1.7	601,175	3.9	408,947	1.3	365,644	4.5	171,767		
Mwanza	1,332,826	2.4	1,021,387	2.3	816,464	2.2	668,956	2.3	456,578		
Rukwa	423,311	4.0	276,091	3.5	195,698	3.3	146,248	3.7	78,692		
Ruvuma	561,575	3.3	393,043	3.9	267,033	1.3	237,221	2.3	162,449		
Shinyanga	1,303,096	3.4	899,468	3.2	657,534	1.8	559,939	1.3	452,014		
Singida	584,691	2.2	457,938	2.2	368,599	0.4	354,948	4.2	176,836		
Tabora	750,519	4.1	481,206	3.0	356,459	0.8	332,428	0.0	330,128		
Tanga	934,368	2.5	710,954	2.8	541,329	2.1	449,139	2.3	305,354		
TOTAL	15,381,332	2.8	11,400,598	2.8	8,618,818	1.7	7,386,079	2.3	5,029,360	2.1	4,099,838

TABLE 2.1.3: POPULATION AND INTER-CENSAL GROWTH RATES OF URBAN[1] AREAS BY REGION, 1931-1978

Towns (Regions)	1978 Total	PGR	1967 Total	PGR	1957 Total	PGR	1948 Total	PGR	1931 Total	PGR	1921 Total
Arusha	55,223	5.1	32,012	12.3	10,038	7.3	5,320		n.a.		n.a.
DSM	769,445	9.9	272,515	7.8	128,742	7.1	69,277	4.2	34,300	3.4	24,600[2]
Dodoma	45,807	6.3	23,440	5.7	13,435	4.0	9,414		n.a.		n.a.
Iringa	57,164	9.3	21,444	8.4	9,587	5.9	5,702		n.a.		n.a.
Bukoba (Kagera)	21,547	9.3	8,061	4.3	5,297	5.6	3,247		n.a.		n.a.
Kigoma	50,075	8.2	21,048	2.6	16,255		n.a.		n.a.		n.a.
Moshi (Kilimanjaro)	52,046	6.3	26,612	6.8	13,726	6.1	8,048		n.a.		n.a.
Lindi	27,312	6.9	13,069	2.4	10,319	2.1	8,577		n.a.		n.a.
Musoma (Mara)	31,051	6.6	15,296	7.8	7,207	10.4	2,962		n.a.		n.a.
Mbeya	76,601	18.1	12,325	5.9	6,932	9.0	3,179		n.a.		n.a.
Morogoro	60,782	8.4	25,097	5.6	14,507	6.6	8,173		n.a.		n.a.
Mtwara	48,491	8.3	20,118	2.8	15,266		n.a.		n.a.		n.a.
Mwanza	110,553	11.2	34,496	5.7	19,877	6.5	11,296		n.a.		n.a.
Sumbawanga (Rukwa)	28,586		n.a.		n.a.		n.a.		n.a.		n.a.
Songea (Ruvuma)	17,955		n.a.		n.a.		n.a.		n.a.		n.a.
Shinyanga	20,439	13.4	5,101	5.8	2,907		n.a.		n.a.		n.a.
Tabora	67,388	11.2	20,862	3.1	15,361	2.1	12,768		n.a.		n.a.
Tanga	103,399	5.1	60,106	4.7	38,053	6.1	22,317		n.a.		n.a.
URBAN TOTAL[1]	1,655,167	10.4	557,750	12.8	166,795	6.9	91,594	5.9	34,300	3.4	24,600
WITHOUT DSM[1]	885,722	10.9	285,235	22.3	38,053	6.1	22,317				

[1] 'Urban areas' are defined as towns and cities of over 20,000 people.

[2] In the 1931 census Dar es Salaam's African population for 1921 is estimated at 20,000-25,000 and the non-African population is enumerated at 4,563. Therefore, 24,600 is a low estimate.

TABLES 2.1.1-3 compiled from:

1) TT, Report on the Native Census, 1921, (DSM, Government Printer, 1921)
2) TT, Non-Native Census, 1921, Report, (DSM, Government Printer, 1921)
3) TT, Census of the Native Population 1931, (DSM, Government Printer, 1932)
4) TT, Report on the Non-Native Census taken in the Territory on the Night of the 26th April, 1931, (DSM, Government Printer, 1932)
5) East African Statistical Department, 'African Population of Tanganyika Territory: Geographical and Tribal Studies', East African Population Census, 1948, (Nairobi, East African Statistical Department, 1950)
6) TT, Report on the Census of the Non-Native Population taken on the Night of 25 February, 1948, (DSM, Government Printer, 1953)
7) Tanganyika, African Census Report 1957, (DSM, Government Printer, 1963)
8) Tanganyika, Report on the Census of the Non-Native African Population taken on the Night of 20/21 February, 1957, (DSM, Government Printer, 1958)
9) Tanzania, 1967 Population Census, Vols. I and II, (DSM, Bureau of Statistics, 1970)
10) Tanzania, 1978 Population Census, Vol. II, (DSM, Bureau of Statistics, 1981)

TABLE 2.2: RAINFALL STATION SUMMARY STATISTICS

Rainfall Station[1]	Region	Rainy Season Months	Wet Month Min.(mm)	Annual Wet Period Mean(mm)	Annual Wet Period Standard Deviation(mm)	Coefficient of Variation	No. of Years of Recorded Rainfall
Arusha	ARUSHA	Nov.- May	64	1066	374	35%	61
Bagamoyo	COAST	Nov.- May	56	883	283	32%	61
Bukoba	KAGERA	Nov.- May	138	1592	339	21%	63
DaresSalaam	DSM	Nov.- May	56	882	256	29%	62
Dodoma	DODOMA	Dec.- April	26	535	150	28%	61
Iringa	IRINGA	Dec.- April	40	679	169	25%	63
Kigoma	KIGOMA	Nov.- April	60	874	187	21%	61
Mahenge	MOROGOO	Dec.- May	120	1782	441	25%	62
Mbeya	MBEYA	Dec.- April	57	845	188	22%	61
Musoma	MARA	Nov.- May	45	711	253	36%	61
Mwita	MTWARA	Dec.- April	49	869	239	28%	55
Tabora	TABORA	Nov.- April	49	814	232	29%	61
Tanga	TANGA	Sept.- Dec.	65	1102	334	30%	62
Tunduru	SONGEA	Dec.-April	54	952	251	26%	61
Utete	COAST	Dec.-June	49	802	205	26%	61

[1] Three criteria were applied in the selection of rainfall stations: 1) wide geographical coverage, 2) the duration of individual station's monthly rainfall records, and 3) the station's proximity to grain produci

Source:
Compiled from Tanzania Meteorology Department rainfall statistics

TABLE 2.2: RAINFALL STATION SUMMARY STATISTICS

Data Handling Procedure and Terminology

Monthly data from 15 Tanzanian rainfall stations, for periods ranging between 55 and 63 years depending on the station, was collected from the Tanzania Meteorology Department in Dar es Salaam. Each rainfall station's data was ordered by year (September through the following August being considered the agricultural year), placed in a mbasic computer file and then merged into the Rainstat.bas programme, specially designed by the late Roger Freeman which performed the following steps:

1) 'Annual monthly means' and 'annual monthly standard deviations' were calculated for the entire data file. E.g. Arusha's annual monthly means from 61 years of data were: 17.1579mm (September), 33.614mm (October), 121.228mm (November), 104.211mm (December), 68.7193mm (January), 77.8793mm (February), 162.759mm (March), 356.614mm (April), 180.732mm (May), 31.9123mm (June), 13.9123mm (July) and 18.3509mm (August).
2) The rainfall station's 'overall monthly mean and standard deviation' for all months of the year were calculated. E.g. Arusha: 98.9241mm mean and 35.2254mm standard deviation.
3) A 'wet month' was defined as any month receiving rainfall equal to or greater than one standard deviation below the rainfall station's overall monthly mean. Monthly rainfall distribution is positively skewed. Thus, a 'wet month' was any month which not a distinctively dry month. For Arusha the wet month minimum was: 98.9241mm - 35.2254mm = 63.6987mm.
4) 'Rainy season months' were defined as all months of the year that have annual monthly means in excess of the overall monthly mean for the rainfall station.[1] In other words those months of the year that were usually wet months. In the case of Arusha the rainy season months extended over a period beginning in November and continuing through May.
5) The file was scanned for missing 'rainy season months' data. Those years which had such gaps were omitted. After the removal of 9 years' data, Arusha was left with a 52-year data series.
6) The remaining wet month data was added up by year to yield 'annual wet period totals'. The 'annual wet period mean and standard deviation' were calculated from these totals. Arusha's annual wet period totals ranged between 370mm and 2002mm with a mean of 1065.56mm and a standard deviation of 373.787mm.

[1] It would have been preferable to define the rainy season as those months in which rainfall exceeded evapo-transpiration and do away with the distinction between wet months and rainy season months, but I did not have evapo-transpiration data for any of the rainfall stations. Niewolt limits agricultural rainy season months to those with a monthly mean of over 50mm (Niewolt, S. 'Seasonal Droughts in East Africa', EAAJ 43(3), (1978), 208-222). He defines a drought month as a rainy season month receiving less than 50% of monthly mean rainfall but not over 100mm in addition to specifying various qualifications regarding monthly sequence and timing. His method of determining agriculturally-useful rainfall is very detailed and would have necessitated a very complex computer programme for the analysis of my data. My data handling procedure is more simple but pivots on the same principles. Although six out of the fifteen rainfall stations have wet month minima which fall below 50mm (three of these being 49mm), only Dodoma, well-known for its aridity is considerably lower than 50mm at 26mm and of course Dodoma farmers' agricultural practices and crop choices have developed around this lower level of normally expected rainfall. My distinction between rainy season months and wet months allows consideration of variation in the timing of annual rainfall. In any particular year, the early or late arrival of the rainy season is accomodated in the 'wet month period' category. In addition the distinction affords maximum use of the data, getting around the problem of having to remove an entire year's rainfall data in every year when one or more monthly rainfall values are missing. Instead, only the years with missing values for months during the critical growing season period are removed.

TABLE 2.3: NET IMPORTS/EXPORTS OF MAIZE, RICE, MILLET/SORGHUM AND WHEAT BY YEAR, 1920-1984 (QUINTALS)[1]

Year	Maize[2]	Rice	Millet/ Sorghum	Wheat[3]	Total Grain
1920	5,470	8,518	136,539	-8,633	141,894
1921	10,753	24,299	119,342	-9,191	145,203
1922	18,965	3,928	102,083	-12,142	112,834
1923	3,905	26,971	62,096	-11,520	81,452
1924	22,474	27,090	80,607	-15,093	115,078
1925	-15,288	11,010	33,871	-22,028	7,565
1926	-30,826	10,891	29,592	-26,980	-17,323
1927	-26,474	20,680	36,792	-34,067	-3,069
1928	-9,012	21,642	78,725	-40,495	50,860
1929	-49,731	-23,567	48,207	-48,105	-73,196
1930	-61,300	12,531	18,107	-54,301	-84,963
1931	-10,452	33,487	53,663	-39,359	37,339
1932	26,082	50,512	42,610	-32,704	86,500
1933	-29,429	60,849	28,966	-38,769	21,617
1934	-77,854	59,829	27,854	-40,462	-30,633
1935	-107,176	46,307	36,625	-44,152	-68,396
1936	-100,032	61,506	36,188	-51,288	-53,626
1937	-74,488	85,707	42,637	-49,120	4,736
1938	-138,755	78,464	18,500	-44,477	-86,268
1939	-133,040	95,785	57,780	-33,982	-13,457
1940	-38,143	151,749	22,706	-30,215	106,097
1941	-90,693	179,424	10,100	-24,365	74,466
1942	-96,086	180,860	13,979	-25,298	73,455
1943	-18,810	47,580	-5,264	-24,527	-1,021
1944	-27,287	44,769	112	-141,449	-123,855
1945	-186,110	21,219	38,050	-25,703	-152,544
1946	-290,874	713	-65,897	3,380	-352,678
1947	-43,152	26,625	32,552	136	16,161
1948	-112,784	65,673	-134,485	-47,143	-228,739
1949	1,055	28,201	759	-3	30,012
1950	-455,001	-29,730	-3,822	-159,276	-647,829
1951	21,646	8,884	-40,828	-140,023	-150,321
1952	84,979	-5,461	-19,961	-166,069	-106,512
1953	-524,677	-725	-8,571	-187,862	-721,835
1954	-190,249	-6,450	2,394	-184,377	-378,682
1955	358,004	8,011	-121,988	-173,665	70,362
1956	1,107,630	11,596	-56,830	-145,983	916,413
1957	88,226	-12,284	-15,637	-201,170	-140,865
1958	214,864	11,460	-59,322	-285,227	-118,225
1959	316,877	-10,310	-40,018	-206,351	60,198
1960	704,188	22,144	62,904	-298,611	490,625
1961	-434,730	7,393	5,774	-284,741	-706,304
1962	-496,043	-4,466	-80,189	-311,591	-892,289
1963	-177,418	5,912	-67,823	-224,965	-464,294
1964	339,675	27,866	-19,082	-283,083	65,376
1965	828	-22,565	24,848	-379,686	-376,575
1966	-165,479	-121,563	37,208	-255,890	-505,724
1967	-54,572	-29,494	76,630	-292,814	-300,250

TABLE 2.3: CONTINUED

Year	Maize	Rice	Millet/ Sorghum	Wheat	Total Grain
1968	273,767	-150,950	13,936	-480,188	-343,435
1969	32,389	-80,168	33,826	-184,619	-198,572
1970	190,115	-67,829	72,810	-319,192	-124,096
1971	4,716	-58,474	89,690	-240,353	204,421
1972	-1,438,200	-4,255	30,408	-418,237	-1,830,280
1973	-244,006	-6,631	41,815	-83,553	-292,375
1974	-482,843	-711,626	6,640	-1,026,980	-2,214,810
1975	-2,404,640	-639,777	-47,720	-1,351,360	-4,443,500
1976	-745,566	-87,835	-341	-149,691	-983,433
1977	-271,601	-520,729	-57	-580,806	-1,373,190
1978	362,927	-471,815	99,968	-751,683	-760,603
1979	159,204	-253,087	136,449	-328,538	-285,972
1980	-2,514,030	-1,026,770	22,311	-440,681	-3,959,170
1981	-1,552,520	-450,558	-72	-596,892	-2,600,000
1982	-1,330,750	-1,033,110	-9,935	-686,959	-3,060,750
1983	-1,210,018	-638,467	0	-110,962	-1,959,447
1984	-1,068,028	-257,738	0	-463,128	-1,788,894

Sources:
1) Tanganyika Blue Books 1920-1945
2) Tanganyika Trade Reports 1946-1948
3) East African Trade Reports 1949-1976
4) Tanzanian Trade Reports 1977-1984

[1] Negative number denotes net imports.
[2] Includes maize flour: 1.0526 maize equivalent
[3] Includes wheat flour: 1.3333 wheat equivalent

TABLE 2.4: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR ANNUAL RAINFALL[1] AND NET GRAIN IMPORT/EXPORT, 1920-1982[2]

Rainfall Station	Maize	Rice	Millet	Wheat
Arusha	.093	.206*	.088	.100
Bagamoyo	-.028	.140	.042	-.021
Bukoba	-.122	-.125	.074	-.262
DaresSalaam	.065	.074	.068	-.039
Dodoma	.241**	.192*	.030	.051
Iringa	.128	.294**	.046	.068
Kigoma	.046	-.100	-.077	-.147
Mahenge	.0923	-.037	-.001	-.156
Mbeya	.377***	-.030	.233**	-.127
Musoma	.240**	-.163	-.013	-.260
Mwita	-.053	-.156	.235**	-.201
Tabora	.064	.135	.106	.029
Tanga	.195*	.277**	.132	.202*
Tunduru	.266**	.083	-.140	-.061
Utete	.054	.227**	-.143	-.014
MEAN AVERAGE	.111	.069	.045	-.060

One-tailed 'T-test' Significance Levels

* 0.100
** 0.050
*** 0.010

[1] Annual rainfall denotes annual 'wet period rainfall' as defined in TABLE 2.2.
[2] There is a four-month lag between annual rainfall and grain import/export figures, e.g. September 1921-August 1922 rainfall is correlated with 1922 import/exports. Years with missing rainy season monthly values were excluded from the analysis.

Sources:
As listed in TABLES 2.2 and 2.3

TABLE 2.5.1: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR ANNUAL RAINFALL[1] AND NET MAIZE IMPORTS/EXPORTS, 1920-1940, 1941-1961 AND 1962-1982[2]

Rainfall Station	1920-40	1941-61	1962-82
Arusha	-.075	-.363	.586*
Bagamoyo	-.087	-.335	.439*
Bukoba	-.192	-.371	.449*
DaresSalaam	-.221	-.065	.459*
Dodoma	-.348	.295	.353
Iringa	-.151	.096	.141
Kigoma	-.033	-.008	.216
Mahenge	.101	.152	.196
Mbeya	.372	.200	.619***
Musoma	.093	.052	.670***
Mwita	-.187	.059	-.075
Tabora	.224	-.108	.340
Tanga	-.086	-.050	.485*
Tunduru	-.182	.460*	.304
Utete	-.172	-.170	.225
MEAN AVERAGE	-.063	-.010	.360

One-tailed 'D-statistic' Significance Levels

* .050
** .010
*** .005

[1] Annual rainfall denotes annual 'wet period rainfall' as defined in TABLE 2.2.
[2] There is a four-month lag between annual rainfall and grain import/export figures, e.g. September 1921-August 1922 rainfall is correlated with 1922 import/exports. Years with missing rainy season monthly values were excluded from the analysis.

Sources:
As listed in TABLES 2.2 and 2.3

TABLE 2.5.2: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR ANNUAL RAINFALL[1] AND NET RICE IMPORTS/EXPORTS, 1920-1940, 1941-1961 AND 1962-1982[2]

Rainfall Station	1920-40	1941-61	1962-82
Arusha	.101	.103	.046
Bagamoyo	.223	.148	.220
Bukoba	.155	.169	.302
DaresSalaam	.093	.025	.364
Dodoma	.253	.101	.151
Iringa	-.087	.218	-.057
Kigoma	.144	-.184	.077
Mahenge	.171	.051	-.213
Mbeya	-.073	-.097	.356
Musoma	-.028	-.343	.037
Mwita	.198	-.098	.125
Tabora	-.164	.125	.011
Tanga	.236	.074	.181
Tunduru	.180	.176	.114
Utete	.300	.402*	.248
MEAN AVERAGE	.113	.058	.131

One-tailed 'D-statistic' Significance Levels

* .050
** .010
*** .005

[1] Annual rainfall denotes annual 'wet period rainfall' as defined in TABLE 2.2.
[2] There is a four-month lag between annual rainfall and grain import/export figures, e.g. September 1921-August 1922 rainfall is correlated with 1922 import/exports. Years with missing rainy season monthly values were excluded from the analysis.

Sources:
As listed in TABLES 2.2 and 2.3

TABLE 2.5.3: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR ANNUAL RAINFALL[1] AND NET MILLET IMPORTS/EXPORTS, 1920-1940, 1941-1961 AND 1962-1982[2]

Rainfall Station	1920-40	1941-61	1962-82
Arusha	.050	.597**	.225
Bagamoyo	-.137	.163	.412*
Bukoba	.117	.541**	.254
DaresSalaam	-.053	-.038	.337
Dodoma	-.661	.241	.218
Iringa	-.033	.154	-.051
Kigoma	-.155	.179	-.068
Mahenge	-.122	.163	-.061
Mbeya	-.364	.226	.498*
Musoma	-.058	.218	.335
Mwita	-.215	.379	.207
Tabora	.129	.217	-.337
Tanga	.159	.238	.392
Tunduru	-.242	-.047	-.111
Utete	-.175	.218	-.248
MEAN AVERAGE	.117	.230	.133

One-tailed 'D-statistic' Significance Levels

* .050
** .010
*** .005

[1] Annual rainfall denotes annual 'wet period rainfall' as defined in TABLE 2.2.
[2] There is a four-month lag between annual rainfall and grain import/export figures, e.g. September 1921-August 1922 rainfall is correlated with 1922 import/exports. Years with missing rainy season monthly values were excluded from the analysis.

Sources:
As listed in TABLES 2.2 and 2.3

TABLE 2.5.4: SPEARMAN'S RANK CORRELATION COEFFICIENTS OF ANNUAL RAINFALL[1] AND NET WHEAT IMPORTS/EXPORTS, 1920-1940, 1941-1961 AND 1962-1982[2]

Rainfall Station	1920-40	1941-61	1962-82
Arusha	-.147	.213	-.143
Bagamoyo	-.227	.170	.108
Bukoba	-.331	-.057	.421*
DaresSalaam	-.498	.019	.313
Dodoma	-.352	-.066	.023
Iringa	-.321	-.020	-.455
Kigoma	.026	-.070	-.109
Mahenge	-.007	-.359	.130
Mbeya	-.318	-.204	.256
Musoma	.049	-.391	.118
Mwita	-.242	-.215	.249
Tabora	-.086	-.003	-.028
Tanga	-.113	.144	.316
Tunduru	-.226	-.017	.060
Utete	-.293	.118	.032
MEAN AVERAGE	-.206	-.049	.086

One-tailed 'D-statistic' Significance Levels

* .050
** .010
*** .005

[1] Annual rainfall denotes annual 'wet period rainfall' as defined in TABLE 2.2.
[2] There is a four-month lag between annual rainfall and grain import/export figures, e.g. September 1921-August 1922 rainfall is correlated with 1922 import/exports. Years with missing rainy season monthly values were excluded from the analysis.

Sources:
As listed in TABLES 2.2 and 2.3

TABLE 2.6: ANNUAL RAINFALL VARIATION, 1920/21-1980/81

	Rainfall Stations' Annual Variation:[1]															NATIONAL
Year	Arusha	Baga-moyo	Bukoba	DSM	Dodoma	Iringa	Kigoma	Mahenge	Mbeya	Musoma	Mwita	Tabora	Tanga	Tun-duru	Utete	RAINFALL INDICATOR[2]
1920/21	n.a.	n.a.	2	n.a.	n.a.	31	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	17
1921/22	-16	-75	-190	-70	n.a.	178	-159	-3	n.a.	-58	n.a.	-37	14	-30	-4	-38
1922/23	54	-134	-146	-182	-53	-64	-25	33	n.a.	-57	n.a.	113	-25	-39	n.a.	-44
1923/24	-18	-81	-36	-85	-64	-41	-59	2	n.a.	n.a.	n.a.	25	48	-132	-22	-39
1924/25	-186	-32	-106	-150	-90	-126	-43	-173	n.a.	-55	n.a.	-146	-181	108	-157	-103
1925/26	107	36	32	93	42	-61	175	-29	n.a.	77	n.a.	257	8	-189	-40	39
1926/27	-37	-70	-71	-52	23	93	69	-20	n.a.	81	n.a.	28	-57	-106	-56	-13
1927/28	-69	52	82	150	-145	33	-202	-110	n.a.	-149	n.a.	30	28	-59	-106	-36
1928/29	-130	-149	-78	-43	15	-59	-152	-147	-114	-123	-79	-97	-25	22	-80	-83
1929/30	59	14	-35	69	165	150	-12	78	123	24	111	107	-3	84	74	67
1930/31	22	69	45	28	-90	-82	-30	-7	n.a.	-60	-87	6	98	-82	-49	-16
1931/32	114	82	-73	88	-47	5	124	38	n.a.	-94	-33	20	-5	21	76	23
1932/33	-105	-198	-99	-102	49	-82	30	12	3	-75	-90	-29	53	-83	-1	-48
1933/34	-87	8	-96	2	18	110	-270	-37	-61	-161	138	-66	2	11	68	-28
1934/35	75	25	-125	11	-74	33	56	222	-3	-97	-91	20	-28	-41	-138	-10
1935/36	89	33	-9	134	68	177	-18	80	165	132	49	-3	277	86	46	87
1936/37	16	-46	-28	-16	79	125	15	-34	-16	158	-20	41	-74	67	3	18
1937/38	3	44	63	38	25	-48	-98	-150	-89	-102	-36	13	79	-121	68	-21
1938/39	57	18	96	75	-104	-50	30	-142	-126	-85	1	-56	117	-19	28	-11
1939/40	48	131	-63	59	31	65	30	24	24	-9	-3	-9	10	112	-30	28
1940/41	-163	-109	-126	-152	67	-4	-71	2	-26	-89	-46	-47	-42	6	-81	-59
1941/42	250	284	162	n.a.	219	161	147	5	74	37	-5	180	48	-11	194	125
1942/43	-56	-71	-50	77	-70	4	-166	-72	-24	14	8	-33	89	28	165	-10
1943/44	5	19	-21	-62	-33	-40	-134	-23	-69	-47	-188	-139	48	-63	64	-46
1944/45	64	-15	160	-17	156	289	58	142	33	40	198	-17	74	196	140	100
1945/46	-3	-86	-187	-74	-51	-130	66	-62	-122	-83	-196	9	-91	-149	-224	-92
1946/47	169	118	161	134	231	101	6	-27	57	35	11	108	115	237	184	109
1947/48	-40	101	37	-6	-65	37	-87	-47	-30	46	-93	-25	-51	91	48	-6
1948/49	26	-2	-167	-97	-73	-188	27	-85	-170	-189	-128	-224	-15	-79	-104	-98
1949/50	124	157	22	-79	13	-127	137	-54	98	105	63	-65	-27	-5	n.a.	26
1950/51	-46	-104	-73	-38	24	62	10	-47	-21	-26	-49	147	-27	-31	-30	-17
1951/52	61	65	132	-115	7	70	74	42	65	75	107	-27	52	65	-20	44
1952/53	-76	-41	54	-34	-204	-124	-48	-42	-180	-156	-106	-172	75	-135	n.a.	-85
1953/54	n.a.	-9	-33	120	-105	-46	-41	-55	-271	104	-57	-81	6	13	-86	-39
1954/55	n.a.	-15	12	175	-30	-15	74	-23	-10	-21	n.a.	-106	66	30	141	21
1955/56	-105	-3	-84	-8	1	21	42	113	50	31	-5	-50	-166	243	-67	1
1956/57	-26	-44	-103	79	15	140	-36	-19	86	82	-4	-9	57	-18	91	19
1957/58	20	-37	-103	-117	119	25	-125	17	-63	-36	-49	-44	31	46	-9	-22
1958/59	-66	-65	-65	n.a.	35	-89	10	-99	-25	62	-123	-68	-8	62	-120	-40
1959/60	n.a.	-105	47	-72	199	4	141	36	147	188	164	144	-42	40	-52	60
1960/61	n.a.	-22	119	-100	-131	n.a.	-35	n.a.	-46	-60	-108	0	-115	-147	-30	-56
1961/62	64	268	122	253	146	85	219	233	191	359	244	305	n.a.	n.a.	145	203
1962/63	-33	-33	81	19	-81	-59	144	n.a.	-24	29	74	163	n.a.	84	64	33
1963/64	246	5	101	75	119	-10	18	111	45	93	49	174	90	40	217	92
1964/65	-181	-117	-53	-129	-34	-117	-40	-50	40	-74	-59	-85	-199	-107	n.a.	-86
1965/66	7	198	81	34	-83	-109	16	153	-51	81	64	-5	39	-212	-74	9
1966/67	-119	100	37	-84	-119	108	-155	-163	135	-76	134	-7	-77	-55	n.a.	-24
1967/68	137	135	180	35	231	199	79	142	148	53	94	109	146	318	37	136

TABLE 2.6: CONTINUED

	Rainfall Stations' Annual Variation:[1]															NATIONAL RAINFALL
Year	Arusha	Baga-moyo	Bukoba	DSM	Dodoma	Iringa	Kigoma	Mahenge	Mbeya	Musoma	Mwita	Tabora	Tanga	Tun-duru	Utete	INDICATOR[2]
1968/69	-71	n.a.	130	16	-173	-112	21	-58	-49	99	-45	-88	-75	27	49	-24
1969/70	0	-61	-106	n.a.	-11	25	-31	-84	14	42	-114	-10	-133	-37	-142	-46
1970/71	-31	-54	11	-32	67	-154	17	-49	175	-2	5	-38	-106	29	-73	-16
1971/72	-20	90	61	109	-2	13	92	-71	-29	-84	69	-129	-39	11	-40	2
1972/73	-7	-19	239	68	70	-61	-42	10	26	19	97	-100	113	-26	9	26
1973/74	n.a.	-3	32	-140	-25	n.a.	91	42	-71	69	36	-19	-143	-71	-40	-19
1974/75	n.a.	-113	-62	-53	-99	14	-190	-161	-39	-105	-78	-98	-157	-13	45	-79
1975/76	-146	-69	60	27	-80	-107	12	164	-23	-104	56	16	-26	-16	-64	-20
1976/77	-54	-143	-86	-132	-74	-108	-1	-22	-94	-101	-160	-7	-158	-34	-190	91
1977/78	186	61	107	113	-13	-7	99	86	34	81	8	56	187	45	-19	68
1978/79	n.a.	156	124	253	68	-51	86	283	221	143	155	n.a.	234	5	204	145
1979/80	n.a.	-132	-40	-52	31	-60	-70	n.a.	-6	-17	115	-13	-109	32	-41	-28
1980/81	-120	-22	-70	-47	-101	-27	109	98	-107	26	n.a.	81	n.a.	-41	28	-15

[1] The residual resulting from the subtraction of the rainfall station's overall mean from the annual rainfall total divided by the rainfall station's standard deviation. In other words the deviation of the annual rainfall total from the overall mean expressed as a percentage of the standard deviation; a positive value representing greater than average rainfall.

$$\frac{x - \bar{x}}{s.d.}$$

[2] The mean of all the rainfall stations' annual percentage residual values as calculated in [1].

Source:

Compiled from Tanzania Meteorology Department rainfall statistics

TABLE 2.7: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR THE ANNUAL NATIONAL RAINFALL INDICATOR[1] AND NET GRAIN IMPORT/EXPORT, 1920-1982

Net Grain Import/Export Unit	Years: 1920-82	1920-29	1930-39	1940-49	1950-59	1960-69	1970-1980
All Grain	.009						
All Grain per capita	.017	-.176	.224	-.006	.539	-.115	.636**
All Grain per Urban Resident	.040	-.176	-.224	-.030	.515	-.115	-.536
Maize	.102*	-.272	.091	-.309	.515	.024	.736***
Rice	.030						
Wheat	-.147						
Millet/Sorghum	.014						

* Significant at the 0.10 Level, One-tailed 'T-test'
** Significant at the 0.05 Level, One-tailed 'D-statistic'
*** Significant at the 0.01 Level, One-tailed 'D-statistic'

[1] See footnotes TABLE 2.6.

Sources:
National Rainfall Indicator compiled from Tanzania Meteorology Department rainfall statistics.
Grain figures as listed in TABLE 2.3.

TABLE 2.8: OVER AND UNDER-POPULATION[1] BY REGION AND DISTRICT, 1967

REGION/ District	(A) Area (km2)	(B) Population Density	(C) 1967 Population	(D) % of Regional Total	(E) Population Rating[2]
ARUSHA	82,098	7.1	578,022	100%	O - Net 12%[2]
Arusha	2,978	61.0	181,764	31%	O
Masai	63,063	1.7	106,892	19%	U
Mbulu	16,057	18.0	289,366	50%	M
COAST	32,117	13.0	419,107	100%	U - Net 100%
Bagamoyo	9,842	11.9	117,547	31%	U
Kisarawe	8,936	20.2	180,536	28%	U
Rufiji	13,339	9.1	121,024	41%	U
DODOMA	41,310	16.6	685,821	100%	O - Net 100%
Dodoma	16,576	17.9	297,440	40%	O
Kondoa	13,208	16.1	212,195	32%	O
Mpwapwa	11,526	15.3	176,186	28%	O
IRINGA	56,845	11.8	668,159	100%	U - Net 100%
Iringa	28,619	8.1	230,881	50%	U
Mufindi	7,117	16.6	118,467	13%	U
Njombe	21,109	15.1	318,811	37%	U
KAGERA	28,456	22.9	650,571	100%	U - Net 27%
Biharamulo	10,878	7.5	81,854	12%	U
Bukoba	8,029	46.7	374,988	58%	M
Karagwe	6,700	14.5	97,407	15%	U
Ngara	2,849	33.8	96,322	15%	M
KIGOMA	37,039	12.2	452,074	100%	U - Net 54%
Kasulu	9,324	12.8	207,611	46%	M
Kibondo	16,058	8.5	136,918	30%	U
Kigoma	11,657	9.2	107,545	24%	U
KILIMANJARO	13,210	47.4	625,858	100%	O - Net 76%
Kilimanjaro	5,310	89.7	476,223	76%	O
Pare	7,900	18.9	149,635	24%	M
LINDI/MTWARA[3]	82,748	12.2	1,007,381	100%	U - Net 23%
Kilwa	13,852	7.1	97,957	10%	U
Lindi	9,454	24.1	228,062	23%	M
Nachingwea	42,735	1.9	80,482	8%	U
Masasi	8,936	23.9	213,683	21%	U
Mtwara	3,756	30.4	114,345	11%	U
Newala	4,015	68.0	272,852	27%	O
MARA	21,756	24.3	528,713	100%	M - Net 100%
Musoma	17,871	19.0	340,177	64%	M
N.Mara	3,885	48.5	188,536	36%	M

TABLE 2.8: CONTINUED

REGIONS/ Districts	Area (Km2)	Population Density	1967 Population	Population as % of Regional Total	Population Rating
MBEYA/					
SUMBAWANGA*	83,140	11.5	956,574	100%	U - Net 63%
Chunya	27,066	2.0	53,618	6%	U
Mbeya	18,519	9.9	180,208	19%	U
Mbozi	9,583	15.4	147,489	15%	U
Rungwe	5,180	69.5	359,971	38%	M
Sumbawanga	22,792	9.4	215,288	22%	U
MOROGORO	73,039	9.0	659,842	100%	U - Net 71%
Kilosa	14,245	13.6	193,810	29%	M
Morogoro	19,296	15.1	291,110	44%	U
Ulanga	39,498	4.4	174,922	27%	U
MWANZA	19,677	51.9	1,020,080	100%	O - Net 64%
Geita	9,065	41.0	371,407	36%	M
Kwimba	6,087	50.2	305,516	30%	O
Mwanza	3,885	60.3	234,080	23%	O
Ukerewe	640	170.7	109,277	11%	O
RUVUMA	61,255	6.4	393,043	100%	U - Net 100%
Mbinga	8,418	13.7	144,098	37%	U
Songea	34,059	4.4	151,390	38%	U
Tunduru	18,778	5.2	97,555	25%	U
SHINYANGA	50,761	17.7	899,468	100%	O - Net 20%
Kahama	19,943	7.4	147,628	16%	U
Maswa	21,368	20.2	430,916	48%	M
Shinyanga	9,450	34.0	320,924	36%	O
SINGIDA	49,341	9.3	457,938	100%	O - Net 23%
Iramba	7,900	23.3	183,962	40%	O
Manyoni	28,620	2.8	80,157	18%	U
Singida	12,821	15.1	193,819	42%	M
TABORA/					
MPANDA*	121,989	4.4	541,859	100%	U - Net 44%
Nzega	13,727	22.0	302,017	56%	M
Tabora	62,419	2.9	179,039	33%	U
Mpanda	45,843	1.3	60,803	11%	U
TANGA	26,808	26.5	710,002	100%	O - Net 46%
Handeni	13,209	10.1	133,235	19%	M
Korogwe	3,756	37.4	140,306	20%	O
Lushoto	3,497	60.2	210,484	30%	O
Pangani	1,425	19.9	28,426	4%	U
Tanga	4,921	40.1	197,551	29%	M

[1] 'Over-', 'under-' and 'moderately populated' districts represent the ratio between Moore's computed carrying capacities and the actual 1967 population:

O - 'overpopulation', ratio under 0.80

M - 'moderately populated, ratio 0.80-1.49

U - 'underpopulated', ratio over 1.50.

[2] The regional population rating is arrived at by multiplying proportional district populations, column (D) by coefficients of +1, 0, and -1, for over-populated, moderately populated and under-populated, respectively, then summing.

[3] Lindi and Mtwara regions were combined in 1967.

[4] Mbeya region included Sumbawanga district in 1967. Sumbawanga later became part of Rukwa region.

[5] Tabora region included Mpanda district in 1967. Mpanda later became part of Rukwa region.

Sources: compiled from

1) Moore, J.E. 'Rural Population Carrying Capacities of the Districts of Tanzania', BRALUP Research Paper No. 18, (1971), 15

2) Tanzania, 1967 Population Census, Vol. 3

TABLE 2.9: FARMING CHARACTERISTICS AND PRACTICES BY REGION, 1971

Region	Sex Ratio of Adult Family Workers	Percentage of Holdings using: Irrigation	Modern Fertilizer	Farmyard Manure	Compost	Green Manure	By-Products	Mulching
Arusha	101	3.9	24.1	34.0	4.9	1.4	35.2	12.2
Coast	80	0.1	1.2	0.0	0.1	1.9	32.6	0.0
Dodoma	84	0.0	5.2	28.4	0.1	0.0	12.1	0.2
Iringa	81	2.8	5.2	8.6	0.2	2.7	33.3	4.6
Kagera	69	0.0	5.2	8.7	5.6	7.0	45.7	32.0
Kigoma	68	0.0	0.1	16.8	10.9	0.0	59.4	0.2
Kilimanjaro	67	32.7	3.7	47.4	3.1	2.3	39.0	24.5
Mara	82	0.5	1.9	3.0	0.2	0.0	48.9	0.7
Mbeya/ Sumbawanga	87	4.3	8.6	4.3	2.9	1.9	46.3	1.1
Morogoro	79	1.5	0.6	0.0	0.0	0.0	84.8	0.0
Mtwara/ Lindi	85	0.6	1.3	0.0	0.0	0.8	34.7	6.5
Mwanza	95	0.8	8.9	5.8	1.5	6.2	32.0	5.0
Ruvuma	85	0.5	17.9	3.2	3.1	17.5	48.9	0.8
Shinyanga	102	2.3	13.5	5.6	3.4	0.7	46.6	0.3
Singida	86	0.4	19.5	17.7	0.0	4.4	46.9	0.0
Tabora	97	0.1	18.1	19.6	1.1	8.3	42.5	3.4
Tanga	83	5.1	2.1	7.1	2.0	2.8	69.4	2.0
TOTAL	85	3.2	7.4	11.0	2.1	3.1	44.5	5.9

Region	Per Agricultural Worker: Hoes	Ploughs	Carts	Tractors	Oxen	Donkeys	Cattle
Arusha	0.88	.0421	.0048	.0017	.1415	.0215	5.80
Coast	1.26	-	-	.0012	-	-	0.03
Dodoma	1.92	-	-	-	.0143	.0055	2.43
Iringa	1.44	.0288	.0023	.0010	.0323	.0031	0.80
Kagera	1.72	-	.0023	.0041	-	-	0.44
Kigoma	1.08	-	-	.0009	-	-	0.35
Kilm.	1.40	.0012	.0132	.0079	.0065	.0022	0.87
Mara	3.35	.1366	.0050	.0006	.2993	.0061	2.98
Mbeya	1.19	.0050	.0034	.0016	.0649	.0017	0.85
Morogoro	1.25	-	-	.0019	-	-	0.23
Mtwara/ Lindi	1.20	-	.0042	.0008	.0047	.0060	0.01
Mwanza	1.38	.0162	.0007	.0027	.0515	.0096	1.77
Ruvuma	1.46	-	.0052	-	-	-	0.10
Shinyanga	1.13	.0737	.0119	.0036	.1982	.0012	2.08
Singida	1.24	.0399	.0068	-	.1140	.0120	2.91
Tabora	1.32	.0687	.0024	.0013	.1857	.0028	2.45
Tanga	1.11	.0002	.0007	.0018	.0004	.0009	0.55
TOTAL	1.68	.0266	.0062	.0020	.0641	.0044	1.41

Source: Tanzania, Agricultural Census of Tanzania 1971/72, Vol. I, Peasant Farming, (DSM, Bureau of Statistics, 1979), Tables 6,7,15,17

TABLE 2.10: SPEARMAN'S RANK CORRELATION COEFFICIENTS OF REGIONAL OVER/UNDER-POPULATION AND FARMING CHARACTERISTICS AND PRACTICES

Farming Characteristics and Practices:	Regional Over/Under-Population: All Regions	All Regions except Dodoma and Singida[1]
Sex Ratio of Adult Family Workers	.194	.196
Holdings per capita usage of:		
Irrigation	.140	.393
Modern Fertilizers	.262	.243
Farmyard Manure	.583***	.489*
Compost	.093	.345
Green Manure	-.031	.039
By-Products	-.180	-.034
Mulches	.223	.488*
Regional per capita number of:		
Hoes	.039	-.111
Cattle	.600***	.600**
Oxen	.412	.482*
Ploughs	.447*	.488*
Tractors	.248	.625***

Two-tailed 'D-statistic' Significance Levels

* .100
** .050
*** .020

[1] Omitted because extreme semi-aridness puts special constraints on agricultural intensification.

Sources: As listed in TABLES 2.8 and 2.9

TABLE 2.11.1: RECORDED MAIZE YIELDS BY YEAR (Kg/Ha)

Year	Yield	Location	Description
1926	1603	Rufiji (Coast), EASTERN PROV.	local variety, mean ave. of 14 peasant plots
1927	1897	Singida, CENTRAL PROV.	Potchefstroom Pearl variety, mean ave. of 3 agric stn trial plots
	1962	" " "	White Congo variety, mean ave. of 2 agric stn trial plots
	796	Dodoma, CENTRAL PROV.	local varieties, mean ave. of 2 peasant plots
	2089	Rufiji, (Coast), EASTERN PROV.	local varieties, mean ave. of 38 peasant plots
	1594	" " " "	local varieties, mean ave. of 17 peasant plots
	1849	Kilwa (Coast), EASTERN PROV.	local varieties, mean ave. of 8 peasant plots
	2891	Upare (Kilimanjaro), NORTHERN PROVINCE	local varieties, mean ave. of 8 peasant plots
	2555	" "	local varieties, mean ave. of 10 peasant plots
	699	Lindi, SOUTHERN PROV.	local variety, peasant plot
	615	Tabora, WESTERN PROV.	local variety, mean ave. of 5 peasant plots
1928	1272	Rufiji (Coast), EASTERN PROV.	local varieties, mean ave. of 4 peasant plots
	2115	Morogoro (Coast), EASTERN PROV.	local varieties, mean ave. of 3 peasant plots
	1016	Biharamulo, WESTERN PROV.	local varieties, mean ave. of 5 peasant plots
	610	Mwanza, WESTERN PROV.	local variety, 1 peasant plot
	778	Kwimba, WESTERN PROV.	local variety, 1 peasant plot
	474	Maswa, WESTERN PROV.	local variety, 1 peasant plot
	712	Shinyanga, WESTERN PROV.	local variety, 1 peasant plot
	1611	Kibondo, WESTERN PROV.	local variety, mean ave. of 2 peasant plots
	2115	Kasulu, WESTERN PROV.	local variety, 1 peasant plot
1933	1334	Ukiriguru, WESTERN PROV.	local variety using native hoe, labour costed at 0.25 cents per day, net profit Shs. 54.00
	1779	" " "	local variety using plough, labour costed at 0.25 cents, net profit Shs. 80.00/ha
1934	1614	Ukiriguru, WESTERN PROVINCE	variety, mean ave. on peasant plots
	977	Lubaga, (Shinyanga) LAKE PROV.	Lubaga Agricultural Station
1945	495	Korogwe, TANGA PROVINCE	Mean average yield on 1646 ha of estate maize
1946	880	SOUTHERN HIGHLANDS PROV.	Mean average of 2845 ha. of non-native production
	292	Korogwe, TANGA PROVINCE	Mean average of 3351 ha. of estate maize
1947	1089	SOUTHERN HIGHLANDS PROVINCE	Mean average of 2695 ha. of non-native production
	563	Korogwe, TANGA PROVINCE	Mean average of 5265 ha. of estate maize
1948	825	SOUTHERN HIGHLANDS PROVINCE	Mean average of 2536 ha. of non-native production
	1132	Korogwe, TANGA PROVINCE	Mean average of 3205 ha. of estate maize
1950	503	Iringa, S.HIGHLANDS PROV.	Mean average of 2954 ha. non-native production
	4003	Moshi, NORTHERN PROV.	Maximum yield in a record year

TABLE 2.11.2: RECORDED RICE YIELDS BY YEAR (Kg/Ha)

Year	Yield	Location	Description
1926	1472	Rufiji (Coast), EASTERN PROV.	local varieties (husked), mean ave. of 9 peasant plots
1927	2471	Rufiji (Coast), EASTERN PROV.	Africa local variety, agric. stn. trial plot
	2382	" " " "	Mamla local variety, agric. stn.
1928	907	Singida, CENTRAL PROV.	mean ave. of 4 peasant plots
	4078	Rufiji (Coast), EASTERN PROV.	mean ave. of 22 local varieties tested by the agric.stn.
	1405	Rufiji (Coast), EASTERN PROV.	mean ave. of 54 peasant plots
	1459	Morogoro (Coast), EASTERN PROV.	mean ave. of 37 peasant plots
1937	4730	Lubaga (Shinyanga) LAKE PROV.	MajiMaji variety, maximum yield
1946	2214	Rufiji (Coast), EASTERN PROV.	Ngowe local variety, agric. stn. trial plot
	2916	" " " "	Meno Meupe local variety, agric. stn. trial plot
	2036	" " " "	Kilimali local variety, agric. stn. trial plot
1947	nil	" " " "	Afa local variety, agric. stn. trial variety
	890	" " " "	Jegeremati local variety, agric. stn. trial plot
	146	" " " "	Kimoto local variety, agric. stn. trial plot
1948	nil	" " " "	Faya local variety, agric. stn. trial plot
	1423	" " " "	Afiri local variety, agric. stn. trial plot
1950	761	" " " "	Unyengwa local variety, agric. stn. trial plot
	880	" " " "	Mwanga local variety, agric. stn. trial plot
	2660	Sukumaland, LAKE PROV.	Peasant agriculture, 1950 Agricultural Census
1951	998	Rufiji (Coast), EASTERN PROV.	Kilowae local variety, agric. stn. trial plot
	237	" " " "	Mpemba local variety, agric. stn. trial plot
1952	1068	" " " "	Kichawachawa local variety, agric. stn. trial plot
	141	" " " "	Hebu local variety, agric. stn. trial plot
	1868	" " " "	Komomango local variety, agric. stn. trial plot
	1186	" " " "	Almeri Mgeni local variety, agric. stn. trial plot
	nil	" " " "	Bungala local variety, agric. stn. trial plot
	1138	" " " "	Mean average of above 19 trial plots
1952	1505	" " " "	Local varieties (husked), mean ave. of 38 peasant plots
	2089	" " " "	local varieties (unhusked), mean ave. of 47 peasant plots
1954	3923	Malya, LAKE PROVINCE	Average yield on 24 irrigated ha. of the Malya Rice Scheme
1957	1457	Mlali, EASTERN PROV.	Average yield of 12 growers sampled on the Mlali Irrigation Scheme
1958	3139	Mlali, EASTERN PROV.	Average yield of 12 growers sampled on the Mlali Irrigation Scheme
1959	3773	Mlali, EASTERN PROV.	Average yield of 12 growers sampled on the Mlali Irrigation Scheme

TABLE 2.11.3: RECORDED SORGHUM/MILLET YIELDS BY YEAR (Kg/Ha)

Year	Yield	Location	Description
1926	1167	Rufiji (Coast), EASTERN PROV.	local variety sorghum, peasant plots mean ave.
1927	450	Singida CENTRAL PROV.	local variety bulrush millet, agric stn trial plot
	124	" " "	Proso millet variety, mean ave. of 3 agric stn trial plots
	1127	" " "	local varieties of sorghum millet, mean ave. of 47 peasant plots
	1426	Rufiji (Coast), EASTERN PROV.	local varieties of sorghum, mean ave. of 29 peasant plots
	1087	" " " "	local varieties of bulrush millet, mean ave. of 6 peasant plots
	1615	" " " "	local varieties of sorghum millet, mean ave. of 33 peasant plots
	1501	Kilwa (Coast), EASTERN PROV.	local varieties of sorghum millet, mean ave. of 24 peasant plots
	719	Morogoro, EASTERN PROV.	heavy-yielding, hard grained varieties of sorghum suitable for storage or export, mean ave. of agric. stn.'s trials on 5 varieties
	1165	Morogoro, EASTERN PROV.	heavy-yielding varieties for local consumption, mean ave. of agric. stn.'s trials on 5 varieties
	642	Lindi, SOUTHERN PROV.	mean ave. of agric. stn.'s trials on 5 varieties
	412	Shinyanga, WESTERN PROVINCE	local varieties of sorghum millet, mean ave. of 2 peasant plots
1928	589	Singida, CENTRAL PROV.	local varieties of sorhum millet, mean ave. of 25 peasant plots
	561	" " "	local varieties of bulrush millet, mean ave of 20 peasant plots
	1357	Rufiji (Coast), EASTERN PROV.	local varieties of sorghum millet, mean ave. of 25 peasant plots
	526	Morogoro, EASTERN PROV.	varieties of sorghum millet, mean ave. of 13 peasant plots
	586	Biharmulo, LAKE PROV.	local varieties of sorghum millet, mean ave. of 3 peasant plots
	1061	Mwanza, LAKE PROV.	local variety of sorghum millet, 1 peasant plot
	1772	" " "	local variety of bulrush millet, 1 peasant plot
	511	Kwimba, LAKE PROV.	local variety of sorghum millet, 1 peasant plot
	2119	" " "	local variety of bulrush millet, 1 peasant plot
	495	Maswa, LAKE PROV.	local variety of sorghum millet, 1 peasant plot
	680	Shinyanga, LAKE PROV.	local variety of sorghum millet, 1 peasant plot
1934	573	Ukiriguru, WESTERN PROV.	local variety, mean ave. of peasant plots
1950	1060	Sukumaland, LAKE PROV.	sorghum, peasant agriculture census average, 1950 Agricultural Census
	784	" " "	millet, peasant agriculture census average, 1950 Agricultural Census
1954	1779	Dodoma, CENTRAL PROV.	recorded yield of Enyanza sorghum on the tribal farm at Dodoma

TABLE 2.11.4: RECORDED WHEAT YIELDS BY YEAR (Kg/Ha)

Year	Yield	Description
1944	5410	Mean average yield of Northern Province Wheat Scheme
1945	8580	" " " " " " " "
1946	6491	" " " " " " " "
	356	Mean average yield of S. Highlands non-native producers
1947	3774	Mean average yield of Northern Province Wheat Scheme
	445	Mean average yield of S. Highlands non-native producers
1948	483	Mean average yield of S. Highlands non-native producers
1950	330	Mean average yield on 1174 ha. of Iringa non-native wheat production
1951	3336	Average yield in non-native production
1952	2446	Average yield in non-native production

Sources:

1) Tanganyika, Department of Agriculture Annual Reports
2) East African Statistical Department, 'Tanganyika: Report on the Analysis of the Sample Census of African Agriculture 1950 (Revised)', (Nairobi, East African Statistical Department, 1953), 34

TABLE 2.12: NUTRITION STATUS, INFANT MORTALITY AND CHILD SURVIVAL BY REGION, 1978

Region	Incidence of Underweightness[1]	Incidence of Kwashiorkor[2]	Infant Mortality[3]	Child Survival[4]
Arusha	6.8	0.7	108	821
Coast	5.9	0.6	121	796
Dar es Salaam	7.5	0.5	108	821
Dodoma	11.2	1.4	133	775
Iringa	16.0	1.2	152	743
Kagera	8.2	1.0	133	775
Kigoma	2.7	0.2	163	731
Kilimanjaro	6.5	1.3	76	881
Lindi	5.0	0.8	151	745
Mara	6.2	0.9	140	764
Mbeya	3.8	1.5	161	733
Morogoro	8.0	0.6	140	764
Mtwara	4.5	0.4	161	733
Mwanza	5.7	0.8	139	767
Rukwa	8.9	2.5	170	717
Ruvuma	6.2	1.1	145	755
Shinyanga	4.6	0.9	150	748
Singida	13.7	1.2	137	769
Tabora	3.9	0.9	140	764
Tanga	10.5	1.4	112	813
MEAN AVERAGE	7.3	1.0	137	769

Sources:

[1] Percentage of children (under 6 years of age) attending MCH clinics who were underweight, July-December, 1978. Compiled from Tanzania Food and Nutrition Centre, 'Data Report on the Food and Nutrition Situation in Tanzania, 1974/5-1979/80', Table 27.10

[2] Percentage of children (under 6 years of age) attending MCH clinics suffering from kwashiorkor, July-December, 1978. Source listed in [1].

[3] Mortality per thousand children under one year of age. Sembajwe, I.S.L. 'Mortality Levels', 1978 Population Census, Vol. VIII, (1983), 307.

[4] Survival per thousand children under five years of age. Source listed in [3].

TABLE 2.13: SPEARMAN'S RANK CORRELATION COEFFICIENTS FOR REGIONAL[1] NUTRITIONAL STATUS AND CHILD SURVIVAL BY YEAR[2]

Year/ Months	Underweightness and Kwashiorkor	Underweightness and Under-five Child Survival	Kwashiorkor and Under-five Child Survival
1976			
Jan.-June	-.005	.094	-.486**
July-Dec.	.037	.412*	.152
1977			
Jan.-June	.337	.386	-.195
July-Dec.	.046	.388	.138
1978			
Jan.-June	.409*	.246	.130
July-Dec.	.504**	.405*	.074

Two-tailed 'D-statistic' significance levels

* .100

** .050

[1] Excludes Dar es Salaam Region

[2] Months and years refer to underweightness and kwashiorkor measures whereas the under-five child survival rate pertains to the 1978 census.

Sources:

1) Tanzania Food and Nutrition Centre, 'Data Report on the Food and Nutrition Situation in Tanzania', Tables 27.4-27.10

2) Sembajwe, I.S.L. 'Mortality Levels', 1978 Population Census, Vol. VIII, (1983), 307

TABLE 2.14: SPEARMAN'S RANK CORRELATION COEFFICIENTS OF REGIONAL° DEMOGRAPHIC, HEALTH, AND ECONOMIC VARIABLES, 1978

	(A) Infant Mortality Rate	(B) Child Survival Rate	(C) Incidence of Under-weightness	(D) Incidence of Kwashiorkor	(E) Crude Birth Rate	(F) Total Fertility Rate	(G) Population Growth Rate	(H) Population Density
(A) Infant Mortality Rate[1]	1.000	-.984****	-.393*	-.050	.385	.001	.094	-.368
(B) Child Survival Rate[2]		1.000	.405*	.074	-.348	.039	-.059	.378
(C) Incidence of Under-weightness[3]			1.000	.503**	.128	.326	-.018	.091
(D) Incidence of Kwashiorkor[4]				1.000	.477**	.638***	.347	.044
(E) Crude Birth Rate[5]					1.000	.847****	.356	.174
(F) Total Fertility Rate[6]						1.000	.432*	.383
(G) Population Growth Rate[7]							1.000	-.362
(H) Regional Population Density[8]								1.000

° Excludes consideration of Dar es Salaam region, which is entirely urban in character.

Two-Tailed 'D-statistic' Significance Levels

*	.100
**	.050
***	.010
****	.002

TABLE 2.14: CONTINUED

	(I) MCH Attend-ance	(J) Population per Health Centre Staff	(K) % Women 9 years Education	(L) % Women-1st Maternity Age >23	(M) Rural Sex Ratio
(A) Infant Mortality Rate	-.019	.093	-.190	-.750****	-.292
(B) Child Survival Rate	.030	-.082	.229	.762****	.310
(C) Incidence of Under-weightness	-.229	-.211	.359	.168	.026
(D) Incidence of Kwashiorkor	-.001	-.270	.510**	.052	-.119
(E) Crude Birth Rate	-.361	-.082	.171	-.204	-.241
(F) Total Fertility Rate	-.361	-.161	.273	.075	.017
(G) Population Growth Rate	-.185	-.339	.236	-.129	.460**
(H) Population Density	.026	.105	-.187	.367	-.096
(I) MCH Attend-ance[9]	1.000	-.198	.028	-.017	.097
(J) Population per Health Centre Staff[10]		1.000	-.642***	.256	-.243
(K) % of Women 9 Years Education[11]			1.000	-.087	.100
(L) % of Women 1st Matern Age >23[12]				1.000	.186
(M) Rural Sex Ratio[13]					1.000

TABLE 2.14: CONTINUED

		(N) Reg'l Product per Capita	(O) Export Crop Sales per Capita	(P) Food Crop Sales per Capita	(Q) Roads per km2
(A)	Infant Mortality Rate	.308	-.258	.134	-.506**
(B)	Child Survival Rate	.318	.268	-.124	.560**
(C)	Incidence of Under-weightness	.051	-.197	.104	.250
(D)	Incidence of Kwashiorkor	.082	-.075	.407*	.219
(E)	Crude Birth Rate	.003	-.391*	.368	.035
(F)	Total Fertility Rate	.066	-.101	.183	.348
(G)	Population Growth Rate	.232	.139	.401*	-.298
(H)	Population Density	-.054	.116	-.312	.618***
(I)	MCH Attend-ance	.281	.377	.009	.171
(J)	Population per Health Centre Staff	-.144	.109	-.621***	.240
(K)	% of Women 9 Years Education	.404*	-.062	.432*	-.040
(L)	% of Women 1st Matern Age >23	.163	.153	-.114	.681****
(M)	Rural Sex Ratio	.199	.515**	.006	.161

TABLE 2.14: CONTINUED

	(N) Reg'l Product per Capita	(O) Export Crop Sales per Capita	(P) Food Crop Sales per Capita	(Q) Roads per km2
(N) Reg'l Product per Capita[14]	1.000	.293	-.107	.139
(O) Export Crop Sales per Capita[15]		1.000	-.407*	.367
(P) Food Crop Sales per Capita[16]			1.000	-.247
(Q) Roads per km2[17]				1.000

Sources:

[1] Sembajwe, I.S.L. 'Mortality Levels', 1978 Population Census, Vol. VIII, (1983), 307
[2] as above
[3] Tanzania Food and Nutrition Centre, Data Report, (1982), Table 27.10
[4] as above
[5] Ngallaba, S.A.M. 'Fertility Levels and Patterns', 1978 Population Census, Vol. VIII, (1983), 362
[6] as above
[7] Mbaruku, H., 'Regional Population Growth and Its Components', 1978 Population Census, Vol. VIII, (1983), 113-114
[8] Maro, P.S., 'Population Distribution and Density', 1978 Population Census, Vol. VIII, (1983), 93
[9] MCH patient attendance as a percentage of all children under five years of age compiled from Tanzania Food and Nutrition Centre, 'Data Report', Table 27.10 and Tanzania, Bureau of Statistics, 1978 Population Census, Vol. II
[10] Population per primary health centre staff. USAID, Tanzania: Country Development Strategy Statement (1982). Quoted in ILO, Basic Needs in Danger, (Addis Ababa, United Printers, 1982), 320
[11] USAID figures quoted in ILO, Basic Needs, 320
[12] as above
[13] Tanzania, 1978 Population Census, Vol. II
[14] USAID figures quoted in ILO, Basic Needs, 320
[15] Compiled from Tanzania, Ministry of Agriculture, 'Bulletin of Crop Statistics, 1981/82', DSM, (April 1983), assorted tables
[16] as above
[17] USAID figures quoted in ILO, Basic Needs, 320

TABLE 2.14: INTERPRETATION

Note: Columns and rows are listed alphabetically and are referred to in the text below in brackets (row,column).

Demographically, the normally expected pattern emerges; a weak positive relationship between infant mortality and the crude birth rate (A,E) and a weak inverse relationship between child survival and the crude birth rate (B,E), although there was no association between infant mortality and the total fertility rate (A,F). The absence of an association could have resulted from the high degree of aggregation and adjustment in the regional census figures. Taken at face value the non-correlation might be interpreted as meaning that Tanzania is in a pre-demographic transition stage with a natural fertility pattern, (i.e. there is no notion of a desired family size) whereas regression results from a 1973 rural fertility survey of Northeastern Tanzania (Moshi, Vunja and Lushoto districts) revealed large positive significant coefficients between the two variables with the fertility replacement response to high infant and child mortality clearly evident (See Kocher, J.E., 'Rural Development and Fertility Change in Tropical Africa: Evidence from Tanzania', BRALUP Research Paper No. 53, (1979), 42). The positive relations between infant mortality and the crude birth rate (A,E) would support this.

The incidence of kwashiorkor is positively related to both the crude birth rate (D,E) and the total fertility rate (D,F) at a significant level. Kwashiorkor occurs most often at the weaning stage of a child's life, and children who are weaned under the age of one year are especially vulnerable. A high fertility rate can result in reduced birth intervals and early weaning of suckling children due to pregnancy.

As regards health variables, MCH attendance measured against the total under-five child population in each region did not have a strong relationship with the nutrition variables (C,I; D,I) and had a weak negative association with fertility (E,I; F,I). Population per health centre did not have an association with mortality (A,J; B,J), and unexpectedly, had a very weak inverse relationship with nutrition (C,J; D,J). From this evidence, accessibility to health services could not be positively associated with nutrition or child mortality. Nor did it have a notable impact on fertility (E,J; F,J).

The female status variables gave stronger but more ambiguous results. As expected, female education was inversely correlated with infant mortality (A,K) and had a positive relationship with child survival (B,K). Surprisingly, however, female education was positively associated with underweightness (C,K) and kwashiorkor (D,K), the latter at a significant level. It is unlikely that malnourished children are more frequently found amongst the more educated, and thus this finding probably suggests that educated women are more likely to seek medical attention for their malnourished children. It is possible that less educated women might deliberately refrain from bringing kwashiorkor children to the dispensary out of embarrassment or because they rely more on traditional cures. Also contrary to general expectations, education does not seem to reduce fertility (E,K; F,K). There is an inverse correlation between the proportion of mothers' whose first maternity was at 23 years and child mortality with a high level of significance (A,L; B,L), yet the maternity variable did not have much effect on nutrition (C,L; D,L) and had a weak negative correlation with the crude birth rate (E,L). Finally, the rural sex ratio correlated inversely with infant mortality (A,M) and positively with child survival (B,M). Rural sex ratios tend to be low, more men have migrated to urban areas than women. The regions with relatively high sex ratios where the sex ratio is more balanced appear to generate lower mortality and lower fertility (E,M), with a suggestion of a lower incidence of kwashiorkor as well (D,M). The significant positive correlation between rural sex ratios and regional population growth rates suggests male-led in-migration (G,M).

TABLE 2.14: INTERPRETATION CONTINUED

Finally, the economic variables reveal some interesting patterns. The regional product per capita, export crop sales per rural inhabitant and roads per km2 are all inversely related to infant mortality (A,N; A,O; A,Q), the latter at a significant level. Conversely, food crop sales per rural inhabitant are positively correlated with infant mortality (A,P), albeit weakly. This points to a dichotomy that persists throughout most of the economic data, regions with a strong export crop economy are distinguishable from those reliant on food crop sales, with a significant, negative correlation between export crop sales and food crop sales variables (O,P).

Whereas food crop sales are positively related to underweightness (C,P), kwashiorkor at a significant level (D,P), and fertility (E,P; F,P), the opposite is true for export crop sales (C,O; D,O, E,O; F,O). Contrary to what might be expected, there is no evidence that food crop sale areas are more disadvantaged in health and education infrastructure than cash crop areas, in fact the opposite seems to prevail (J,P; K,P versus J,O; K,O). The differences between the two probably lie more at the level of productive infrastructure and household labour, as suggested by the fact that export crops are positively correlated with roads (O,Q) and at a significant level with the rural sex ratio (M,O), whereas there is no association between food crop sales and the rural sex ratio (M,P) and a negative correlation with roads (P,Q). The densely populated regions are very significantly correlated with roads (H,Q).

TABLE 2.15: ANNUAL INCIDENCE OF FOOD SHORTAGE BY REGION, 1919-1982

1919-1929

Regions	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Arusha				XXXX							XXXX
Coast	XX				XX	XX		XX		XX	XX
Dodoma	XXXX	XXXX					XXXX	XXXX			XXXX
Iringa	XX	XX		XX							
Kagera											XXXX
Kigoma		XX									
Kilimanjaro											
Lindi			XXXX	XXXX		XX		XXXX	XXXX		XXXX
Mara				XXXX							
Mbeya											
Morogoro							XX	XX			
Mwanza	XXXX	XXXX									
Mtwara								XXXX	XXXX	XXXX	
Rukwa							XX				XX
Ruvuma								XXXX	XXXX		
Shinyanga											XXXX
Singida											
Tabora										XXXX	
Tanga									XXXX		

1930-1939

Regions	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Arusha	XXXX								XXXX	XXXX
Coast	XXXX	XXXX		XXXX	XXXX	XXXX	XXXX	XX		
Dodoma			XX		XXXX	XXXX		XX		
Iringa		XXXX	XXXX			XX	XX		XX	XX
Kagera	XX		XX	XX	XX			XX	XX	
Kigoma								XXXX		
Kilimanjaro										
Lindi	XXXX		XXXX	XXXX	XXXX	XX				
Mara										
Mbeya										
Morogoro	XXXX			XXXX	XXXX	XX				
Mwanza									XX	XX
Mtwara	XX					XX			XX	
Rukwa							XX			
Ruvuma	XXXX		XX					XXXX		
Shinyanga					XXXX				XX	
Singida					XX					
Tabora			XX						XX	XX
Tanga			XXXX	XXXX	XXXX					XXXX

XX - food shortage
XXXX - severe food shortage

TABLE 2.15: CONTINUED

1940-1949

Regions	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
Arusha			XX	XX			XXXX	XXXX		XXXX
Coast	XX		XX		XX	XXXX	XXXX		XXXX	
Dodoma		XXXX	XXXX	XXXX		XXXX	XXXX	XXXX	XXXX	XXXX
Iringa				XXXX	XXXX					XXXX
Kagera	XXXX	XX	XXXX	XXXX	XXXX					XX
Kigoma			XX							
Kilimanjaro										
Lindi			XXXX	XXXX			XXXX			
Mara									XX	XX
Mbeya			XX				XX			XXXX
Morogoro		XX	XX	XXXX		XXXX	XXXX	XX	XX	XXXX
Mwanza				XX					XX	XX
Mtwara					XX	XX		XX		XX
Rukwa		XX	XX				XX			XX
Ruvuma	XX	XX	XX	XX						
Shinyanga			XX	XXXX	XX		XX		XXXX	XXXX
Singida								XX		
Tabora	XX	XX	XX				XXXX			XXXX
Tanga					XXXX	XX	XX			XXXX

1950-1959

Regions	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Arusha	XXXX	XX	XX	XXXX	XXXX	XXXX	XX	XX		XX
Coast						XX				
Dodoma	XXXX			XXXX	XXXX	XXXX				
Iringa	XXXX		XX	XXXX	XXXX					XX
Kagera	XX			XX						
Kigoma				XX					XX	
Kilimanjaro										
Lindi	XX		XXXX	XXXX	XXXX	XX	XX	XX	XXXX	XXXX
Mara										
Mbeya				XXXX	XXXX	XX				XX
Morogoro	XX			XXXX	XXXX			XX	XX	
Mwanza	XX			XXXX						XX
Mtwara	XX								XX	XX
Rukwa	XX			XX			XX	XX	XX	
Ruvuma	XX	XX	XX	XX		XXXX	XXXX			XX
Shinyanga	XXXX			XXXX					XX	
Singida	XXXX		XX	XX	XX		XX	XX		
Tabora	XX		XX	XXXX	XX					XX
Tanga	XXXX		XXXX	XXXX						

TABLE 2.15: CONTINUED

1960-1963[1]

Regions	1960	1961	1962	1963
Arusha		XXXX	XXXX	
Coast			XXXX	XXXX
Dodoma		XXXX	XXXX	XXXX
Iringa	XX	XX		
Kagera				
Kigoma				
Kilimanjaro				
Lindi	XX	XX		
Mara		XX		
Mbeya	XX	XX		
Morogoro	XX	XXXX		
Mwanza	XX			
Mtwara	XX			
Rukwa		XX		
Ruvuma	XX	XX		
Shinyanga				
Singida	XX	XX	XX	
Tabora				
Tanga	XXXX	XXXX	XXXX	XXXX

1975/76-1981/82[1]

Regions	1974/ 1975	1975/ 1976	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982
Arusha	XXXX	XXXX	XX	XX				
Coast	XX		XX	XX				
Dodoma	XXXX	XXXX	XXXX	XXXX	XX	XXXX		
Iringa	XX	XX	XX	XXXX	XX			
Kagera								
Kigoma								
Kilimanjaro	XXXX	XX						
Lindi		XX		XX	XX	XXXX		XX
Mara	XXXX						XX	
Mbeya	XX	XX			XX	XX		
Morogoro	XXXX	XXXX	XX		XX			
Mwanza	XX							
Mtwara				XX				XX
Rukwa		XX						
Ruvuma								
Shinyanga	XXXX	XXXX						
Singida	XXXX	XXXX	XXXX	XXXX		XX	XX	
Tabora	XXXX	XX	XX					
Tanga	XXXX			XXXX	XX	XX	XX	

[1] Aggregated records of food shortages are unavailable for the years between 1964 through 1975.
[2] Note the incidence of food shortages between 1919-1963 and 1975/76-1981/82 is not strictly comparable because of different source material. The former period is probably more detailed and accurate because it is based on mission documentation as well as government records.

Sources:

1) 1919-1963 - Brooke, C. 'Types of Food Shortages in Tanzania', Geographical Review, LVII, (1967), 336-37
2) 1974/5 - Kataboro, D. L., Food Security and Decentralization in Tanzania, M.A. Thesis, UDSM, (1978), 29
3) 1976-1982 - Compiled from official famine relief figures, Prime Minister's Office, 'Maafa na Msaada ya Chakula', n.d. Famine relief issues of over 2,000 tons are counted as 'severe food shortages' denoted by XXXX.

TABLE 3.1: ANNUAL REVENUE AND EXPENDITURE OF TANGANYIKA TERRITORY, 1928/29-1950

Year	Total Revenue (Shs)	Total Expenditure (Shs)	Net Revenue/ Expenditure (Shs)	Total Expenditure per Capita (Shs)	% of Total Expenditure assigned to: Health	Educ.	P.W.D.°	Agric.	Police, Prisons	External Defence	Prov'l & Nat. Admin.
1928/29	37,974,600	37,460,140	514,460	7.87	12.4	4.1	18.9	5.5	7.3	6.9	18.2
1929/30	39,853,500	41,697,960	-1,844,460	8.58	11.9	4.3	21.4	7.1	6.6	5.7	17.8
1930/31*	n.a.	n.a.	n.a.		12.6	5.9	19.4	6.3	6.9	4.7	19.3
1931/32	30,447,360	36,418,560	-5,971,200	7.19	12.2	6.7	3.6	6.4	7.5	5.6	19.3
1933	31,290,760	33,103,860	-1,813,100	6.25	11.5	5.4	8.1	6.3	8.3	5.0	19.6
1934	34,405,700	37,429,920	-3,024,220	6.91	10.0	4.6	7.4	5.9	7.4	4.1	17.4
1935	39,477,260	35,001,360	4,475,900	7.32	11.1	4.6	8.2	6.0	8.1	4.3	19.6
1936	44,128,340	40,596,480	3,531,860	7.16	9.2	4.2	10.2	5.2	7.0	4.7	17.0
1937	46,900,080	43,478,440	3,421,640	7.50	9.3	4.2	10.0	4.7	6.7	4.6	16.2
1938	42,265,880	43,720,640	1,454,760	7.37	9.3	4.5	10.0	5.0	6.9	6.0	16.8
1939	42,666,900	45,222,860	2,555,960	7.45	8.6	4.6	8.2	5.1	7.1	7.6	16.0
1940	46,162,160	44,829,100	1,333,060	7.22	8.6	4.5	6.8	6.7	7.2	6.2	15.8
1941	51,471,020	51,003,800	467,220	8.03	8.7	4.0	7.1	4.4	6.3	5.8	13.6
1942	62,588,920	62,640,520	- 51,600	9.65	7.1	4.0	6.7	5.6	5.4	5.3	5.0
1943	74,595,300	74,500,840	94,460	11.22	7.4	4.2	8.4	5.3	5.1	4.4	10.1
1944	84,147,940	83,618,780	529,160	12.30	8.3	4.5	11.2	6.1	4.8	3.6	5.0
1945	95,369,300	95,125,160	244,140	13.66	7.7	4.9	12.1	6.7	4.2	3.0	4.9
1946	102,935,180	102,845,440	89,740	14.43	7.6	5.6	8.9	6.3	4.3	2.4	4.8
1947	114,949,320	113,299,040	1,650,280	15.52	6.9	5.6	8.2	6.5	4.5	2.3	5.0
1948	139,296,940	127,639,280	11,657,660	17.07	7.5	5.8	8.3	7.1	5.2	1.9	5.1
1949	171,712,920	155,448,800	16,264,120	20.42	8.2	5.2	10.0	6.4	7.1	1.6	5.4
1950	207,937,740	202,455,980	5,481,760	26.13	6.8	3.6	10.1	5.1	7.4	1.5	4.5

* Approved estimate not actual expenditure.
° Public Works Department

Source: Tanganyika, 'Estimates of the Revenue and Expenditure of Tanganyika', (DSM, Government Printer, 1928-1950)

TABLE 3.2: NATIONAL BUDGET EXPENDITURE ALLOCATED TO AGRICULTURE, 1928/29-1984

Year	Agriculture Votes as % of Total Nat'l Budget	TShs. per Rural Inhabitant	Year	Agriculture Vote as % of Total Nat'l Budget	TShs. per Rural Inhabitant	Year	Agriculture Votes as % of Total Nat'l Budget	TShs. per Rural Inhabitant
1928/29	5.5	0.43	1951	4.3	1.37	1973/74	11.8	38.92
1929/30	7.1	0.61	1952	3.9	1.55	1974/75	15.3	68.61
1930/31*	6.3	0.55	1953	6.2	2.28	1975/76	14.2	59.79
1931/32	6.4	0.47	1954/55	5.1	2.19	1976/77	11.6	63.29
1933	6.3	0.40	1955/56	5.3	2.46	1977/78	9.3	55.26
1934	5.9	0.41	1956/57	6.9	2.98	1978/79	7.0	59.32
1935	6.0	0.38	1957/58	6.1	2.66	1979/80	10.7	97.57
1936	5.2	0.37	1958/59*	6.3	3.00	1980/81	10.1	92.62
1937	4.7	0.36	1959/60*	6.2	2.90	1981/82	7.4	82.60
1938	5.0	0.37	1960/61*	6.1	3.50	1982/83	7.7	85.12
1939	5.1	0.38	1961/62*	11.1	6.72			
1940	6.7	0.49	1962/63	9.7	6.16			
1941	4.4	0.35	1963/64	9.2	7.03			
1942	5.6	0.54	1964/65	7.0	7.56			
1943	5.3	0.60	1965/66	-	-			
1944	6.1	0.76	1966/67	9.8	11.13			
1945	6.7	0.92	1967/68	10.2	12.61			
1946	5.4	0.92	1968/69	10.6	14.90			
1947	6.5	1.01	1969/70	10.2	18.11			
1948	7.1	1.23	1970/71	11.3	22.48			
1949	6.4	1.33	1971/72	9.9	19.89			
1950	5.1	1.36	1972/73	10.1	24.60			
MEAN	5.8	0.65						

* Budget estimate as opposed to actual expenditure.

Source:
TT, 'Estimates of the Revenue and Expenditure of Tanganyika', (DSM, Government Printer, 1930/31-1952)

TABLE 4.1: NUMERICAL ESTIMATES OF THE AFRICAN WAGE LABOUR FORCE, 1926-1950*

Year	Agricult'l Workers	Trade, Transport, Industry	Mining	Public Works Dept.	Railway	Domestic & Personal Service	Timber Production	Misc.	Total
1926	140,000	109,000	7,000	n.a.	n.a.	20,000	n.a.	n.a.	276,000
1927	150,000	60,000	7,000	n.a.	n.a.	21,000	n.a.	n.a.	238,000
1928	170,000	53,200	7,000	n.a.	n.a.	25,000	n.a.	n.a.	255,200
1929	185,000	54,200	7,000	n.a.	n.a.	27,000	n.a.	n.a.	273,200
1930	140,000	45,100	4,000	10,321	10,462	24,000	n.a.	n.a.	233,883
1931	110,000	41,100	4,000	12,223	8,691	20,000	n.a.	n.a.	196,014
1932	110,000	41,000	4,000	5,139	6,910	18,000	n.a.	n.a.	185,049
1933	110,000	43,000	16,000	4,693	6,219	18,000	n.a.	n.a.	197,912
1934	110,000	43,000	24,000	8,640	6,426	18,000	n.a.	n.a.	210,066
1935	112,000	37,000	24,000	8,546	6,479	20,000	n.a.	n.a.	208,025
1936	124,000	40,000	32,000	19,034	7,072	20,000	n.a.	n.a.	242,106
1937	125,000	37,500	32,000	9,151	7,146	22,000	n.a.	n.a.	232,797
1938	125,000	51,000	n.a.	7,250	7,244	30,000	n.a.	n.a.	220,494
1939	125,000	51,000	n.a.	6,228	7,319	30,000	n.a.	n.a.	219,547
1940	125,000	51,000	n.a.	6,228	7,703	30,000	n.a.	n.a.	219,931
1941	125,000	51,000	n.a.	21,848	7,175	30,000	n.a.	n.a.	235,023
1942	133,000	41,100	24,000	12,649	9,437	35,000	n.a.	n.a.	255,186
1943	133,000	32,000	18,000	12,236	16,937	25,000	n.a.	6,100	243,273
1944	170,500	15,000	21,000	32,540	11,901	25,000	11,500	22,000	309,441
1945	197,000	14,000	17,500	30,400	11,185	25,000	15,000	18,500	328,585
1946	175,500	14,500	17,000	11,000	12,728	25,500	10,000	20,000	286,228
1947	185,000	16,500	16,000	13,000	13,450	25,500	8,500	20,000	297,950
1948	211,000	20,000	16,000	13,000	n.a.	30,000	7,500	25,000	322,500
1949	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	349,239
1950	196,141	28,049	18,833	n.a.	11,064	37,173	10,775	58,208	360,243

[1] No labour statistics are available before 1926. Labour censuses were conducted in 1944 and 1949.

[2] The 1944 labour census yielded a much higher total number of labourers than anticipated and suggests that totals for previous years may have been underestimated by a considerable degree.

Source: TT, Blue Books, 1926-1948 and Department of Labour Annual Reports, 1949-1950

TABLE 4.2 PROVINCIAL AND OCCUPATIONAL DISTRIBUTION OF AFRICAN WAGE LABOUR FORCE, 1949

Province	Clerical Staff	Shop, Office, Store Boy	Mechanics, Fitters	Carpenters, Joiners	Masons, Bricklayers	Drivers	Other Skilled Labourers	Unskilled Labourers	Total	Provincial Percentage
Central	935	632	1,074	798	1,116	1,506	3,392	14,628	24,314	7.0
Eastern	1,869	3,200	1,671	1,504	2,207	1,286	6,446	57,991	76,174	21.8
Lake	1,177	2,320	424	420	587	500	3,419	16,872	25,719	7.4
Northern	1,163	1,025	423	482	685	752	3,038	33,693	41,261	11.8
Southern	2,127	1,230	1,042	1,062	1,534	802	4,080	26,979	38,856	11.1
S.Hghlds	782	832	683	692	1,409	350	2,106	19,097	25,951	7.4
Tanga	1,716	1,424	1,411	882	1,917	913	3,634	73,599	85,496	24.5
Western	1,057	1,055	844	963	908	1,193	4,838	20,610	31,468	9.0
TOTAL	10,826	11,718	7,572	6,803	10,363	7,302	30,953	263,469	349,239	100.0
Occup'l %	3.1	3.4	2.2	1.9	3.0	2.1	8.9	75.4	100.0	

Source:
Results of Labour Census, 15 September, 1949 reported in Tanganyika, Department of Labour Annual Report, 1949, Appendix A

TABLE 5.1: ANNUAL EXPORTS OF MAJOR PEASANT CASHCROPS, 1920-1984

	Export Crops (Quintals):		
Year	Coffee	Cotton	Cashewnut
1920	21,821	9,855	
1921	38,875	11,178	
1922	43,490	15,723	
1923	41,205	14,959	
1924	53,569	25,873	
1925	61,187	45,835	
1926	66,587	49,745	
1927	67,150	40,120	
1928	106,209	49,816	
1929	90,182	50,368	
1930	117,572	37,371	
1931	94,194	24,702	
1932	115,688	32,673	
1933	129,495	51,666	
1934	150,347	57,470	
1935	189,263	101,602	
1936	123,671	114,777	
1937	138,595	117,279	
1938	139,796	90,311	
1939	169,008	118,438	9,303
1940	159,182	108,157	15,400
1941	139,155	133,431	12,380
1942	150,976	81,542	1,648
1943	110,961	71,291	144
1944	158,439	60,515	7,511
1945	147,035	73,223	27,175
1946	102,032	40,298	32,310
1947	141,099	71,723	13,040
1948	114,637	100,720	56,593
1949	122,596	109,989	36,157
1950	150,615	71,335	66,512
1951	166,585	84,658	83,133
1952	188,270	113,063	117,159
1953	154,468	150,166	115,648
1954	220,198	123,304	185,854
1955	210,078	207,419	207,580
1956	245,287	283,940	190,907
1957	205,181	277,028	383,753
1958	246,127	326,418	357,060
1959	221,939	312,592	378,715
1960	283,768	395,720	418,733
1961	278,801	302,048	455,714
1962	260,838	331,684	672,970
1963	296,806	487,006	485,088
1964	333,458	452,716	638,307
1965	282,977	562,600	727,752
1966	507,149	863,190	836,202
1967	445,269	608,401	859,676

TABLE 5.1: CONTINUED

Year	Coffee	Cotton	Cashewnut
1968	399,135	629,875	845,543
1969	493,187	568,226	916,077
1970	447,107	606,595	901,001
1971	351,484	547,827	1,136,490
1972	547,179	644,880	1,258,186
1973	602,291	600,068	1,263,986
1974	410,286	490,619	1,318,537
1975	543,852	380,431	1,151,049
1976	578,693	551,708	934,198
1977	467,050	404,209	921,057
1978	507,370	467,351	603,578
1979	452,240	314,088	565,580
1980	432,822	314,756	256,977
1981	508,788	440,995	547,934
1982	521,705	386,974	389,267
1983	507,340	397,703	204,826
1984	522,355	274,020	328,748

Sources:

1) Tanganyika Blue Books 1920-1945
2) Tanganyika Trade Reports 1946-1948
3) East African Trade Reports 1949-1976
4) Tanzanian Trade Reports 1977-1982

TABLE 5.2: NOMINAL AND REAL UNIT EXPORT VALUE OF COFFEE, COTTON AND SISAL, 1920-1973 (1963=100)

	NOMINAL:[1]			REAL:[2]		
Year	Coffee	Cotton	Sisal	Coffee	Cotton	Sisal
1920	27.2	75.9	31.5			
1925	34.1	53.6	34.6			
1930	14.7	30.1	21.5			
1935	11.2	25.5	12.6			
1940	12.0	25.4	17.5			
1945	26.5	46.7	25.5			
1950	99.0	92.0	95.4	125.3	116.5	120.8
1951	116.4	148.5	159.0	122.5	156.3	167.4
1952	127.1	188.1	133.1	129.7	191.9	143.1
1953	162.2	146.1	70.8	174.4	157.1	76.1
1954	197.0	123.7	61.6	216.5	135.9	67.7
1955	142.5	121.2	53.8	154.9	131.7	58.5
1956	163.2	119.8	54.6	170.0	124.8	56.9
1957	147.4	107.9	48.9	144.5	111.2	49.9
1958	129.8	100.9	48.9	133.8	104.0	50.4
1959	111.6	96.8	59.6	116.3	100.8	60.8
1960	109.7	101.4	70.0	111.9	103.5	71.4
1961	105.1	102.2	65.7	104.0	103.2	66.4
1962	109.4	101.3	67.5	106.2	102.3	68.2
1963	100.0	100.0	100.0	100.0	100.0	100.0
1964	143.4	99.2	99.4	142.0	98.2	98.4
1965	131.2	98.6	64.0	126.2	94.8	61.5
1966	128.8	92.1	56.5	122.7	87.7	53.8
1967	115.3	93.9	46.7	108.8	88.6	44.1
1968	121.3	102.0	39.7	114.4	96.2	37.5
1969	112.9	93.8	43.9	103.6	86.1	40.3
1970	151.4	92.6	38.4	130.5	79.8	33.1
1971	140.3	101.5	38.4	115.0	83.2	31.5
1972	151.9	118.5	43.7	116.0	90.5	33.4
1973	178.5	126.1	91.6	115.9	81.9	59.5

Sources: Compiled from

[1] Tanzania, Annual Trade Reports, assorted years

[2] As above deflated by industrial countries' manufactured goods unit value export index (United Nations, Statistical Yearbook, annual)

TABLE 5.3: AFRICAN WAGE LABOUR FORCE, 1950-1960

Year	Estate Agriculture	Mining	Manuf'g[1]	Building & Const.	Commerce	Transport	Public Services	Other Services	Domestic Service	Others	Total	Non-African Labour Force
1950[2]	206,916	18,833	9,875	n.a.	29,238		41,383	n.a.	37,173	16,825	360,243	
1951	239,248	18,329	25,996	45,667	19,350	23,905	31,427[3]	26,946	15,342	9,188	455,398	
1952	234,317	16,529	22,539	21,253	14,627	6,951	89,519	16,874	20,430	558	443,597	39,868[5]
1953	226,601	17,730	17,691	14,265	11,743	6,892	103,037	12,674	30,000	7,638	448,271	
1954	218,094	15,453	19,669	16,373	11,428	6,535	100,596	12,565	30,000	8,381	439,094	
1955	201,350	14,346	19,014	12,161	11,267	6,204	99,368	11,261	30,000	8,129	413,100	
1956	207,112	14,596	18,988	12,977	9,341	7,416	102,343	14,054	40,000	7,382	434,209	
1957	211,351	12,975	19,839	11,377	9,675	8,157	94,284	12,777	40,000	10,035	430,470	38,616[6]
1958	213,092	12,182	21,326	10,438	11,800	7,891	97,170	15,559	40,000	1,089	430,547	
1959	220,199	9,560	19,737	11,148	12,572	8,940	94,350	16,562	35,000	200	428,268	
1960	199,021	11,060	18,349	9,093	12,835	6,076	86,237	14,804	30,000	n.a.	397,475	
1961											383,117	
1962											368,816	

[1] Includes electricity and water supply from 1951 to 1960.
[2] Does not include an estimated 22,000 women and children labourers and 38,000 male casual labourers.
[3] Government services and Native Authorities.
[4] Includes all public servants - no allocation having been made to other industrial groups.
[5] Taken from the 1952 Non-African Population Census.
[6] Taken from the 1957 Non-African Population Census.

Sources: Compiled from
1) Tanganyika, Department of Labour Annual Report, 1950
2) East African Statistical Department, Statistical Abstract, 1951-63

TABLE 5.4: TOTAL WAGE EMPLOYMENT BY INDUSTRY AND SECTOR, 1961-1978[1]

Year	Estate Agric.	Mining	Manuf'g	Public Utilities	Building & Const.	Commerce	Transport	Services	Finance	Total
1961	204,958	11,875	26,363	6,910	41,775	17,700	21,412	70,853	-	401,846
Private	95%	99%	97%	32%	35%	100%	32%	34%		74%
Public	5%	1%	3%	68%	65%	0%	68%	66%		26%
1962	203,845	8,674	23,397	5,277	41,173	16,943	23,344	68,496	-	391,149
Private	95%	100%	95%	37%	38%	100%	55%	34%		74%
Public	5%	0%	5%	63%	62%	0%	45%	66%		26%
1963	165,532	7,596	22,212	3,880	28,290	16,477	24,409	71,948	-	340,344
Private	94%	96%	96%	47%	39%	100%	37%	32%		72%
Public	6%	4%	4%	53%	61%	0%	63%	68%		28%
1964	163,589	8,035	23,583	4,637	33,740	17,341	25,670	74,662	-	351,257
Private	94%	97%	96%	39%	34%	100%	36%	32%		70%
Public	6%	3%	4%	61%	66%	0%	66%	68%		30%
1965	139,162	7,418	25,729	4,752	31,457	17,843	26,426	80,968	-	333,755
Private	92%	97%	95%	44%	45%	100%	39%	28%		68%
Public	8%	3%	5%	56%	55%	0%	61%	72%		32%
1966	126,223	6,191	29,890	5,303	37,460	20,935	27,560	82,935	-	336,497
Private	91%	96%	95%	39%	36%	100%	43%	30%		66%
Public	9%	4%	5%	61%	64%	0%	57%	70%		34%
1967	123,887	6,493	31,186	7,093	41,929	20,077	29,725	86,351	-	346,741
Private	86%	97%	96%	31%	36%	100%	48%	30%		64%
Public	14%	3%	4%	69%	64%	0%	52%	70%		36%
1968	109,213	6,121	35,359	9,601	47,305	21,415	31,764	90,933	-	351,711
Private	84%	92%	96%	27%	31%	100%	43%	31%		60%
Public	16%	8%	4%	73%	69%	0%	57%	69%		40%
1969	112,888	5,919	40,323	9,755	52,767	19,072	32,389	90,556	4,257	367,926
Private	82%	96%	96%	27%	29%	100%	48%	26%	94%	59%
Public	18%	4%	4%	73%	71%	0	52%	74%	6%	41%
1970	107,368	6,096	43,746	11,296	54,569	20,617	33,813	93,295	4,835	375,635
Private	85%	95%	97%	26%	38%	100%	46%	18%	94%	59%
Public	15%	5%	3%	74%	62%	0%	54%	82%	6%	41%
1971	108,971	5,753	55,158	10,603	50,931	23,353	37,404	94,929	5,668	392,770
Private	83%	94%	96%	28%	41%	99%	42%	16%	95%	59%
Public	17%	6%	4%	72%	59%	1%	58%	84%	5%	41%
1972	113,843	5,558	55,389	12,304	51,842	24,777	37,049	98,575	6,356	405,713
Private	86%	95%	93%	25%	41%	99%	44%	15%	97%	59%
Public	14%	5%	7%	75%	59%	1%	56%	85%	3%	41%
1973	109,047	5,013	59,336	18,904	104,777	26,713	38,115	104,083	6,515	472,503
Private	83%	95%	95%	27%	67%	99%	49%	16%	95%	68%
Public	17%	5%	5%	73%	33%	1%	51%	84%	5%	32%

TABLE 5.4: CONTINUED

Year	Estate Agric.	Mining	Manuf'g	Public Utilities	Building & Const.	Commerce	Transport	Services	Finance	Total
1974	123,973	4,762	64,921	16,074	72,810	25,322	45,166	123,659	7,399	484,086
Private	82%	94%	95%	24%	50%	100%	44%	14%	96%	57%
Public	18%	6%	5%	76%	50%	0%	56%	86%	4%	43%
1975	121,831	5,143	74,133	14,872	61,625	34,982	45,847	103,008	9,355	470,796
Private	81%	95%	95%	26%	52%	100%	56%	18%	96%	63%
Public	19%	5%	5%	74%	48%	0%	44%	82%	4%	37%
1976	132,343	5,281	75,003	15,001	43,044	37,981	52,206	110,785	9,080	480,724
Private	85%	87%	97%	25%	39%	100%	58%	19%	96%	64%
Public	15%	13%	3%	75%	61%	0%	42%	81%	4%	36%
1977	126,722	4,984	79,318	18,145	35,028	32,338	52,296	127,283	7,560	483,674
Private	85%	87%	96%	27%	38%	100%	61%	18%	95%	62%
Public	15%	13%	4%	73%	62%	0%	39%	82%	5%	38%
1978	123,374	4,935	100,072	21,886	42,311	34,290	59,189	140,954	8,934	535,945
Private	84%	85%	97%	21%	40%	100%	67%	13%	95%	61%
Public	16%	15%	3%	79%	60%	0%	33%	87%	5%	39%
1979	127,970	5,859	107,097	19,786	50,555	40,047	55,476	177,667	12,311	596,768
1980	130,979	5,900	105,803	19,542	48,650	38,096	58,319	181,984	13,920	603,193
1981	129,550	7,020	114,234	21,060	49,778	37,653	59,350	204,217	15,316	638,178
1982	137,449	7,231	118,234	21,460	51,377	38,030	60,166	229,170	16,900	676,017

[1] Includes Africans and non-Africans.

Sources: Compiled from

1) Tanganyika, Central Statistical Bureau, Statistical Abstract, (DSM, Government Printer), various years
2) Tanzania, Survey of Employment and Earnings, (DSM, Government Printer), 1962-1978
3) Tanzania, The Economic Survey, 1982, (DSM, Government Printer, 1983), 63

TABLE 5.5: TRADE UNION MEMBERSHIP AND STRIKES, 1950-1973

Year	Registered Unions	Members	Number of Strikes[1]	Number of Workers Involved	Number of Working Days Lost
1950			50	7,444	11,006
1951	0	0	73	7,851	12,775
1952	1	381	82	10,547	15,923
1953	6	960	61	7,131	6,812
1954	7	-	43	4,621	7,842
1955	22	2,714	42	8,877	12,562
1956	25	13,390	54	17,695	58,066
1957	25	35,153	114	39,786	165,328
1958	30	46,528	153	67,430	296,746
1959	35	80,606	205	82,878	402,693
1960	40	95,393	203	89,495	1,494,773
1961	35	203,000	101	20,159	113,254
1962	n.a.	n.a.	152	48,434	417,474
1963	"	"	85	27,207	77,195
1964	"	"	24	3,582	5,855
1965	"	"	13	884	1,825
1966	"	"	16	2,062	8,845
1967	"	"	25	3,224	7,224
1968	"	"	13	1,906	5,757
1969	"	"	4	874	2,141
1970	"	"	3	357	726
1971	"	"	3	654	3,026
1972	"	"	0	0	0
1973	"	"	0	0	0

[1] Excludes strikes lasting less than one day.

Sources:

1) Jackson, D., 'The Disappearance of Strikes in Tanzania', The Journal of Modern African Studies, 17(2), (1979), 220

2) Iliffe, J. A Modern History of Tanganyika, (Cambridge, Cambridge University Press, 1979), 539

TABLE 5.6: NOMINAL WAGE RATES, 1950-1984 (TShs.)

	Government Rate for Unskilled Labour:[1]		Dar es Salaam Minimum Wages:[2]		Territorial Minimum Wage:[3]
Year	Daily	Monthly	Daily	Monthly	Monthly
1950	1/75	43/00			
1951	2/00	49/00			
1952	2/15	52/00			
1953	2/40	59/00			
1954	2/55	62/00			
1955	3/00	73/00			
1956	3/00	73/00			
1957			3/36	82/00	
1958				82/00	
1959			4/00	98/00	
1960				98/00	
1961				98/00	
1962				98/00	
1963					150/00
1964					150/00
1965					150/00
1966					150/00
1967					150/00
1968					150/00
1969					170/00
1970					170/00
1971					170/00
1972					240/00
1973					240/00
1974					340/00
1975					380/00
1976					380/00
1977					380/00
1978					380/00
1979					380/00
1980					480/00
1981					480/00
1982					600/00
1983					600/00
1984					810/00

Sources: Compiled from

[1] Tanganyika, Labour Department Annual Reports, 1950-56, assumes 24.4 days as an average working month.

[2] Tanganyika, Labour Department Annual Reports, 1957-63, assumes 24.4 days as an average working month.

[3] Jackson, D. 'The Disappearance of Strikes in Tanzania: Incomes Policy and Industrial Democracy', Journal of Modern African Studies, 17(2), (1979), 248; Jamal, V. 'The Political Economy of Devaluation in Tanzania', ILO, Addis Ababa, (1984), 32; Daily News 15/6/84

TABLE 5.7: WAGE EARNERS' COST OF LIVING INDICES, 1939-1983

Year	Cost of Living Index for Dar es Salaam (1939 = 100)[1]	Retail Price Index of Goods Consumed by Africans (1951 = 100)[2]	Retail Price Index - Wage Earners Dar es Salaam (1963 = 100)[3]	Retail Price Index - Wage Earners Dar es Salaam (1970 = 100)[4]	Amalgamated Consumer Price Index - Wage Earners Dar es Salaam (1963 = 100)[5]
1939	100				24
1942	122				29
1943	155				37
1944	167				40
1945	177				42
1946	184				44
1947	187				45
1948	247				59
1949	287				69
1950	299				72
1951	351	100			84
1952		105			88
1953		120			101
1954		117			98
1955		114			96
1956		112			94
1957		118			99
1958		123			103
1959		121			102
1960		122			103
1961		123			103
1962		123			103
1963		119	100		100
1964			102.5		103
1965			109.4		109
1966			114.7		115
1967			116.6		117
1968			122.0		122
1969			124.4		124
1970			128.4	100	128
1971			135.5	103	132
1972			145.7	114	146
1973			164.5	124	159
1974			258.6	163	209
1975				243	312
1976				294	377
1977				345	443
1978				403	517
1979				426	547
1980				503	646
1981				647	831
1982				797	1023
1983				983	1262

Sources: Compiled from

[1] Tanganyika, Labour Department Annual Report 1951, 39

[2] Tanganyika, Labour Department Annual Reports, 1951-63, annual average calculated from monthly values

[3] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[4] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[5] Calculated from the above.

TABLE 5.8: DAR ES SALAAM MIDDLE CLASS COST OF LIVING INDICES, 1947-1983

	European & Asian Cost of Living Index, DSM (1950 = 100)[1]	Cost of Living Index - Middle Grade Civil Servants, DSM (1963 = 100)[2]	Cost of Living Index - Middle Grade Civil Servants, DSM (1970 = 100)[3]	Amalgamated Cost of Living Index - Middle Grade Civil Servants, DSM (1963 = 100)[4]
1947	83			
1948	88			
1949				
1950	100			
1951	114			
1952	123			
1053	125			
1954	128			
1955	132			
1956	135			
1957	139			
1958	143			
1959	144			
1960	140			
1961				
1962				
1963		100		100
1964		105.9		106
1965		112.0		112
1966		117.3		117
1967		122.7		123
1968		126.5		127
1969		128.0		128
1970		129.8	100	130
1971		136.1	101	131
1972		145.2	104	135
1973		157.4	119	154
1974		212.2	149	193
1975			199	258
1976			221	287
1977			247	321
1978			295	383
1979			348	452
1980			413	536
1981			544	706
1982			684	888
1983			851	1105

Sources: Compiled from

[1] Tanganyika, Department of Commerce and Industry, Tanganyika Trade Bulletin, Nos. 5-13

[2] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[3] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[4] Calculated from [2] and [3].

TABLE 5.9: NATIONAL CONSUMER PRICE INDEX, 1970-1983 (for 18 Towns)

	National Consumer Price Index (1970 = 100)[1]	Non-food Consumer Price Index (1970 = 100)[2]	Food Consumer Price Index (1970 = 100)[3]
1970	100.0	100.0	100.0
1971	104.7	103.8	105.7
1972	112.7	110.4	115.3
1973	124.5	120.8	128.7
1974	148.4	126.0	173.7
1975	187.7	152.9	226.9
1976	200.6	155.6	251.4
1977	223.8	193.6	257.8
1978	249.3	206.6	297.5
1979	283.6	238.7	334.2
1980	369.4	319.9	425.2
1981	464.1	410.0	525.1
1982	597.3	508.9	697.0
1983	760.3	648.3	886.6

Sources: Compiled from

[1] Bank of Tanzania, Economic and Operations Report, (June 1984), 89

[2] As above.

[3] As above.

TABLE 5.10: MINIMUM WAGE INDEX, 1939-1984

Year	Government Unskilled Wage Rate (1939 = 100)[1]	Government Unskilled Wage Rate (1950 = 100)[2]	Territorial Minimum Wage (1963 = 100)[3]	Nominal Wage Index (1963 = 100)[4]	Real Wage Index (1963 = 100)[5]
1939	100			8	33
1940	160			13	n.a.
1943	200			16	43
1944	220			18	45
1945	260			21	50
1946	260			21	48
1947	320			26	58
1950	350	100		28	39
1951	430	114		32	38
1952	430	123		35	40
1953	510	137		39	39
1954	510	146		42	43
1955	600	171		49	51
1956		171		49	52
1957		192		55	56
1958		192		55	53
1959		229		65	64
1960		229		65	63
1961		229		65	63
1962		229		65	63
1963		351	100	100	100
1964			100	100	97
1965			100	100	92
1966			100	100	87
1967			100	100	85
1968			100	100	82
1969			113	113	91
1970			113	113	88
1971			113	113	86
1972			160	160	110
1973			160	160	101
1974			220	227	109
1975			253	253	81
1976			253	253	67
1977			253	253	57
1978			253	253	49
1979			253	253	46
1980			320	320	50
1981			320	320	39
1982			400	400	39
1983			400	400	32
1984			540	540	n.a.

Sources: Compiled from

[1] Tanganyika, Labour Department Annual Report 1951, 39; Iliffe, J. 'A History of Dockworkers of Dar es Salaam', TNR 71, (1970), 123

[2] Compiled from Tanganyika, Labour Department Annual Reports, 1950-63

[3] Compiled from Jackson, D. 'The Disappearance of Strikes in Tanzania: Incomes Policy and Industrial Democracy', Journal of Modern African Studies, 17(2), (1979), 248; Jamal, V. 'The Political Economy of Devaluation in Tanzania', International Labour Office, Addis Ababa, (1984), 32; Daily News 15/6/84

[4] Compiled from references listed above.

[5] Compiled from references listed above divided by the Retail Amalgamated Consumer Price Index 1939-83 (TABLE 6.6) which is calculated from Tanganyika, Labour Department Annual Report 1951, 39; Tanganyika, Labour Department Annual Reports, 1951-63, annual average calculated from monthly values; Bank of Tanzania, Economic and Operations Report, (June 1975), 86; Bank of Tanzania, Economic and Operations Report, (June 1984), 90

TABLE 5.11: NON-AGRICULTURAL SECTOR AVERAGE WAGE INDEX, 1962-1983

Year	Non-Agricultural Wage (TShs/Month)[1]	Non-Agricultural Average Wage Nominal Index (1963 = 100)[1]	Real Index deflated by DSM Retail Price Index (1963 = 100)[2]	Real Index deflated by Middle Grade Cost of Living Index (1963 = 100)[3]	Non-Agricultural Nominal Wage Index (1970 = 100)[4]	Real Index Deflated by National Consumer Price Index (1970 = 100)[5]
1962	163	78	76			
1963	210	100	100	100		
1964	224	107	104	101		
1965	302	144	132	129		
1966	321	153	133	131		
1967	347	165	141	134		
1968	359	171	140	135		
1969	381	181	146	141		
1970	395	188	147	145	100	100
1971	413	197	149	150	105	100
1972	416	198	136	147	105	93
1973	432	206	130	134	109	88
1974	686	327	156	169	174	117
1975	659	314	101	122	167	89
1976	672	320	85	111	170	85
1977	708	337	76	105	179	80
1978	710	338	65	88	180	72
1979	967	460	84	102	245	86
1980	1036	493	76	92	262	71
1981	1105	526	63	75	280	60
1982	1191	567	55	64	302	51
1983	1060	505	40	46	268	35

Sources: Compiled from

[1] 1962-72 - Tanzania, Survey of Employment and Earnings, various years compilation by Valentine, T.R., 'Government Wage Policy, Wage and Employment Trends, and Economic Instability in Tanzania since Independence', ERB 81.1, (1981), 10-11

1973-83 - Tanzania, Economic Survey, various issues compiled by Jamal, V. 'The Political Economy of Devaluation in Tanzania', ILO, Addis Ababa, (1984), 32

[2] Above deflated by the Dar es Salaam Retail Price Index (see TABLE 5.7).

[3] Above deflated by the Dar es Salaam Middle Grade Civil Servants Cost of Living Index (see TABLE 5.8).

[4] Calculated from [1].

[5] The deflation of [4] above by the National Consumer Price Index (see TABLE 5.9).

TABLE 5.12: ANNUAL REVENUE AND EXPENDITURE OF TANGANYIKA, 1950-1973

Year	Total Recurrent Revenue (TShs.'000)	Total Recurr. & Development Expenditure (TShs.'000)	Net Revenue/ Expenditure (TShs.'000)	Total Expenditure per Capita (TShs.)	% of Total Central Government Expenditure assigned to: Health	Educ.	P.W.D.°	Agric.	Industry	Civil Order & External Defence	Reg'l Admin.
1950	207,938	202,456	5,482	26.20	6.8	3.6	10.1	5.1	-	8.9	4.5
1951	238,616	246,096	- 7,480	31.20	8.1	5.9	14.8	4.3	2.2	9.1	4.6
1952	328,607	317,554	11,053	39.60	6.5	5.4	16.5	3.9	0.2	7.2	3.8
1953	294,558	294,490	68	36.00	7.6	9.5	13.6	6.2	0.3	10.0	5.2
1954/55	385,534	354,002	31,532	42.60	7.3	10.0	9.7	5.1	0.3	11.9	5.2
1955/56	373,599	390,641	- 17,042	46.00	8.5	10.2	12.4	5.3	0.3	11.6	7.8
1956/57	349,845	363,145	- 13,300	42.00	9.2	11.6	12.3	6.9	0.3	13.8	8.7
1957/58	376,686	373,947	2,739	42.60	9.2	12.0	8.7	6.1	0.3	13.3	8.0
1958/59*	388,247	419,517	- 31,270	46.40	9.8	12.4	8.5	6.3	0.3	12.7	9.5
1959/60*	414,380	425,210	- 10,830	45.60	9.1	12.4	7.7	6.2	1.2	14.2	9.5
1960/61*	427,106	537,968	- 110,862	56.00	9.3	15.2	-	6.1	2.9	-	4.7
1961/62*	435,910	583,145	- 147,235	58.80	6.8	14.7	-	11.1	2.1	-	4.4
1962/63*	500,558	629,625	- 129,067	61.60	7.0	17.2	22.2	9.7	1.6	-	-
1963/64*	524,986	778,396	- 253,410	73.90	6.1	15.1	24.2	9.2	3.0	-	-
1964/65*	670,109	1,132,039	- 461,930	104.10	4.4	13.3	23.2	7.0	3.7	4.5	-
1965/66											
1966/67*	786,342	1,259,363	- 473,021	108.70	4.5	14.5	16.9	9.8	2.4	5.6	3.1
1967/68	1,129,500	1,409,100	- 279,600	117.80	5.3	13.8	10.9	10.2	1.2	14.5	-
1968/69	1,269,800	1,646,500	- 376,700	133.30	5.2	13.4	16.7	10.6	1.1	12.7	-
1969/70	1,576,900	2,137,200	- 560,300	167.60	5.5	13.5	11.6	10.2	2.0	13.5	-
1970/71	1,683,100	2,460,600	- 777,500	186.80	6.2	13.7	12.2	11.3	1.9	14.0	-
1971/72*	1,875,000	2,553,600	- 678,600	187.80	6.2	14.8	15.7	9.9	1.6	16.7	-
1972/73	2,356,600	3,182,200	- 825,600	226.60	6.5	13.3	11.7	10.1	2.2	15.3	-

Sources: Compiled from
1950-1966/67 - Tanganyika, Estimates of Revenue and Expenditure of Tanganyika, annual
1967/68-1972/73 - Tanzania, The Economic Survey, 1971-72, (DSM, Government Printer, 1972), 24-27
Tanzania, The Economic Survey 1977-78, (DSM, Government Printer, n.d.), Tables 17 & 18

* Approved estimate not actual expenditure.
° Public Works Department

TABLE 5.13: NOMINAL PEASANT PRODUCER PRICES FOR COTTON AND MAIZE, 1952-1986 (TShs/Kg)

Year	Seed Cotton (AR) Lake Province[1]	Maize Iringa[2]
1952	1.10	
1953	1.10	
1954	1.36	
1955	1.36	
1956	1.36	0.29
1957	1.19	0.25
1958	1.19	0.27
1959	1.14	0.23
1960	1.19	0.17
1961	1.30	0.33
1962	1.21	0.35
1963	1.10	0.345
1964	1.10	0.277
1965	1.06	0.338
1966	1.01	0.27
1967	1.01	0.30
1968	1.06	0.30
1969	1.06	0.25
1970	1.13	0.28
1971	1.10	0.26
1972	1.10	0.26
1973	1.13	0.27
1974	1.13	0.35
1975	1.50	0.50
1976	2.00	0.80
1977	2.00	0.80
1978	2.30	0.85
1979	2.40	0.85
1980	3.00	1.00
1981	3.20	1.00
1982	3.70	1.50
1983	4.70	1.75
1984	6.00	2.20
1985		4.00
1986		5.25

Sources: Compiled from

[1] 1952-1968: Helleiner, G.K., 'Agricultural Marketing in Tanzania: Policies and Problems', ERB Paper 68.14, UDSM, (1968), 25; 1969-74: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister and Second Vice-President, (1974), Annex Table No. I.10; 1975-84: Tanzania, MDB, 'Price Policy Recommendations for the July 1982 Agricultural Price Review: Summary', DSM, (July 1982), Appendix 7

[2] 1956-69: Kriesel, H.C. et al., Agricultural Marketing in Tanzania: Background Research and Policy Proposals, (East Lansing, Michigan State University, 1970), 38; 1970-74: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister, (1974), Annex Table I.4; Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review: Summary, (1984), Appendix IV

TABLE 5.14: NOMINAL AND REAL PRODUCER PRICE INDICES FOR COTTON AND MAIZE, 1952-1986

Year	NOMINAL PRICE: Seed Cotton (AR) Lake Province (1963=100)[1]	Maize Iringa (1963=100)[2]	REAL PRICE:[3] Seed Cotton (AR) Lake Province (1963=100)	Maize Iringa (1963=100)	REAL PRICE:[4] Seed Cotton (AR) Lake Province (1963=100)	Maize Iringa (1963=100)
1952	100		114			
1953	100		99			
1954	124		127			
1955	124		129			
1956	124	84	132	89		
1957	108	72	109	73		
1958	108	78	105	76		
1959	104	67	102	66		
1960	108	49	105	48		
1961	118	96	115	93		
1962	110	101	107	98		
1963	100	100	100	100	100	100
1964	100	80	97	78	90	72
1965	96	98	88	90	84	86
1966	92	78	80	68	74	63
1967	92	87	79	74	70	66
1968	96	87	79	71	66	60
1969	96	72	77	58	59	44
1970	103	81	80	63	63	50
1971	100	75	76	57	61	46
1972	100	75	68	51	55	41
1973	103	78	65	49	49	37
1974	103	101	49	48	41	40
1975	136	145	44	46	30	32
1976	182	232	48	62	42	53
1977	182	232	41	52	37	47
1978	209	246	40	48	39	46
1979	218	246	40	45	36	41
1980	273	290	42	45	40	43
1981	291	290	35	35	31	31
1982	336	435	33	43	31	40
1983	427	507	34	40	29	34
1984	545	638				
1985		1159				
1986		1522				

Sources: Compiled from

[1] 1952-1968: Helleiner, G.K., 'Agricultural Marketing in Tanzania: Policies and Problems', ERB Paper 68.14, UDSM, (1968), 25; 1969-74: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister and Second Vice-President, (1974), Annex Table No. I.10; 1975-84: Tanzania, MDB, 'Price Policy Recommendations for the July 1982 Agricultural Price Review: Summary', DSM, (July 1982), Appendix 7

[2] 1956-69: Kriesel, H.C. et al., Agricultural Marketing in Tanzania: Background Research and Policy Proposals, (East Lansing, Michigan State University, 1970), 38; 1970-74: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister, (1974), Annex Table I.4; Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review: Summary, (1984), Appendix IV

[3] See [1] and [2] which are deflated by the Retail Price Index for DSM (1963=100).

[4] See [1] and [2] which are deflated by the Non-Food Retail Price Index for DSM (1963=100).

TABLE 5.15: URBAN GROWTH RATES AND SEX RATIOS, 1952-1967

Town	Population Growth Rate 1952-67	Sex ratio: 1952	1967	Change
Dar es Salaam	7.0	153	123	-30
High Growth Secondary Cities >6%				
Arusha	10.0	297	131	-166
Iringa	6.8	159	104	-55
Moshi	7.4	195	128	-67
Mean	8.1	217	121	-96
Medium Growth Secondary Cities 4-6.0%				
Morogoro	5.3	131	110	-21
Mtwara	5.5	176	119	-57
Mwanza	6.4	151	119	-32
Tanga	5.1	139	118	-21
Dodoma	4.4	157	114	-43
Mean	5.3	150	116	-34
Low Growth Secondary Cities <4%				
Kigoma	3.1	82	96	14
Tabora	2.7	114	99	-15
Mean	2.9	98	98	0

Sources: Compiled from

1) TT, Report on the Census of the Non-native Population taken on the Night of 13 February, 1952, (DSM, Government Printer, 1954)
2) Tanganyika, African Census Report 1957, (DSM, Government Printer, 1963)
3) Tanzania, 1967 Population Census, (DSM, Bureau of Statistics, 1970)

TABLE 5.16: DAR ES SALAAM HOUSEHOLD FOOD EXPENDITURE, 1950-1969

A. African Low Income Households - % Expenditure on Specific Food Items out of Total Food Expenditure

Year	1950[1]	1956-1957[2]	1965[3]	1969[4]*		
Total Annual Expenditure (TShs.):				0-999	1000-1999	2000-3999
Staple Grains & Roots:	42	45	45	47	44	39
Maize Meal	(21)			(24)	(17)	(13)
Rice	(8)			(23)	(16)	(13)
Bread	(9)				(7)	(9)
Cassava & Sweet Potato	(5)			(1)	(4)	(4)
Beans	2			16	6	4
Meat & Fish	30	21	20	7	14	17
Milk & Dairy Products	n.a.	3	5	-	3	6
Sugar	3	9	7	8	6	5
Food Expenditure as % of Total Expenditure	65	65	56	48	52	48

Sources: Compiled from

[1] Tanganyika, 'Report of the Committee on Rising Costs', (DSM, Government Printer, 1951). An investigation of 75 Dar es Salaam households with labourers earning 75 Shs. a month or less.

[2] East African Statistical Department, Report on Household Budget Survey of Africans living in Dar es Salaam, 1956/57. A survey of African wage earners who had an average income of 158 Shs. Cited in Tanganyika (1964) below.

[3] Tanzania, Household Budget Survey of Wage Earners in Dar es Salaam, 1965, (DSM, Central Statistical Bureau, 1967). A survey of 1,500 Dar es Salaam wage earners earning between 150 and 300 Shs. per month.

[4] Tanzania, 1969 Household Budget Survey: Income and Consumption, Vol. I, (DSM, Bureau of Statistics, 1972)

* Figures are for 'Dar es Salaam excluding Centre' where the African population is preponderant.

TABLE 5.16: DAR ES SALAAM HOUSEHOLD FOOD EXPENDITURE, 1950-1969

B. African High Income Households - % Expenditure on Specific Food Items out of Total Food Expenditure

Year	1964[1]	1969*[2]				
Total Annual Expenditure:		4000-5999	6000-7999	8000-9999	10000-24999	Over 24999
Staple Grains & Roots:	25	37	29	35	28	27
Maize Meal		(11)	(8)	(9)	(7)	(6)
Rice		(14)	(11)	(13)	(11)	(10)
Bread		(9)	(8)	(11)	(8)	(9)
Cassava & Sweet Potato		(3)	(2)	(2)	(2)	(2)
Beans		4	4	3	3	4
Meat & Fish	23	17	15	14	17	19
Milk & Dairy Products	12	6	8	7	7	8
Sugar	4	5	5	6	6	7
Food Expenditure as % of Total Expenditure	32	37	36	31	25	24

Sources: Compiled from

[1] Tanganyika, 'Family Budget Survey of Middle-grade African Civil Servants', (DSM, Central Statistical Bureau, 1964). A survey of 50 Dar es Salaam African civil servants with salaries between 670 and 1670 Shs. per month.

[2] Tanzania, 1969 Household Budget Survey: Income and Consumption, Vol. I, (1972)

* Figures are for 'Dar es Salaam excluding Centre' where the African population is preponderant.

TABLE 5.16: DAR ES SALAAM HOUSEHOLD FOOD EXPENDITURE, 1950-1969

C. Non-African Households - % Expenditure of Specific Food Items out of Total Food Expenditure

Year	1969[1]*				
Total Annual Expenditure	4000-5999	6000-7999	8000-9999	10000-24999	Over 24999
Staple Grains & Roots	18	22	24	24	23
Maize Meal	-	-	-	(1)	(1)-Millet
Rice	(7)	(7)	(10)	(9)	(7)
Bread	(9)	(13)	(13)	(11)	(12)
Cassava & Sweet Potato	(2)	(2)	(1)	(3)	(3)
Beans	5	-	2	1	1
Meat & Fish	18	21	16	11	14
Milk & Dairy Products	19	22	14	14	13
Sugar	3	5	3	5	4
Food Expenditure as % of Total Expenditure	52	78**	44	34	17

Source:

[1] Tanzania, 1969 Household Budget Survey: Income and Consumption, Vol. I, (1972)

* Figures are for 'Dar es Salaam Centre' where the non-African population is preponderant.

** This appears to be an error resulting from incomplete compilation of non-food expenditure categories.

TABLE 5.17: DAR ES SALAAM LOW-INCOME DEMAND ELASTICITIES BY FAMILY SIZE AND EXPENDITURE, 1965

Food Item	Family Size Elasticities	Expenditure Elasticities
Wheat and Maize	0.52	0.32
Rice	0.44	0.54
Meat and Fish	0.28	1.61
Milk Products, Fats and Oils	-0.15	1.15
Sugar and Honey	0.48	0.58
Tobacco and Beverages	0.23	1.06
Vegetables and Pulses	0.05	0.60

Source:

Ostby, I. 'An Econometric Study of Demand Patterns in Dar es Salaam: Preliminary Review', ERB Paper 68.5, UDSM, (1968). Based on a 1965 survey of 105 African wage-earner households with incomes between 150 and 300 TShs. carried out by the Tanzanian Central Statistical Bureau.

TABLE 5.18: DAR ES SALAAM TOTAL HOUSEHOLD EXPENDITURE AND PROPORTION SPENT ON FOOD BY FAMILY SIZE AND INCOME, 1939-1980

	Aug.[1] 1939	Jan.[2] 1942	Aug.[3] 1942	Aug.[4] 1950	1956-[5] 1957	May [6] 1963	May [7] 1965	Apr.[8] 1980
HOUSEHOLD MEMBERSHIP:								
-Bachelor			27.50 (37%)	56.30 (59%)		644.99 (21%)	196.02 (45%)	
-Husb& Wife	31.54 (52%)	38.43 (51%)	41.47 (44%)					
-1.5 to 3 Members				68.74 (64%)				
-2 or Over Members						752.99 (35%)		
-3 to 3.5 Members			48.35 (49%)	80.70 (65%)				
ALL HOUSEHOLDS BY INCOME STATUS:								
-Low Income	31.54 (52%)	38.43 (51%)		69.44 (65%)	126.24 (65%)		206.45 (56%)	755.60 (85%)
-High Income						738.49 (31%)		1,550.47 (40%)

Sources: Compiled from

[1] Baker's survey entitled 'Sociological Conditions in Dar es Salaam' submitted to the District Commissioner and cited in ref. 3) below.

[2] Memorandum submitted to the Panel of the Labour Board convened in January 1942 to enquire into grievances of railway employees, and cited in ref. 3).

[3] Tanganyika 1942, 'Report of Enquiry into Wages and Cost of Living of Low Grade African Government Employees in Dar es Salaam, TNA SMP 30598. An investigation of 2,901 waged government employees earning 60 Shs. a month or less.

[4] Tanganyika 1951, 'Report of the Committee on Rising Costs'. An investigation of 75 DSM households with labourers earning 75 Shs. a month or less.

[5] East African Statistical Department, 'Report on Household Budget Survey of Africans living in Dar es Salaam, 1956-57'. A survey of African wage earners who had an average income of 158 Shs. Cited in ref. 6 below.

[6] Tanganyika 1964, 'Family Budget Survey of Middle-grade African Civil Servants'. A survey of 50 DSM African civil servants with salaries between 670 and 1,670 Shs. a month.

[7] Tanzania 1967, 'Household Budget Survey of Wage Earners in Dar es Salaam, 1965'. A survey of 1,500 DSM wage earners earning between 150 and 300 shillings a month.

[8] Mgaza, O. and H.Bantje (eds.), 'Infant Feeding in Dar es Salaam', TFNC and BRALUP, DSM, 1980. A survey of 228 households: 135 low income earning 1,999 or less shillings per month and 93 high income earning 2,000 or more per month.

TABLE 5.19: FOOD COST OF LIVING INDEX, 1963-1983

Year	Retail Price Index - Wage Earners, DSM (1963 = 100)[1]	Retail Price Index - Wage Earners, DSM (1970 = 100)[2]	Amalgamated Food Retail Price Index - Wage Earners, DSM (1970 = 100)[3]	Cost of Living Index - Middle Grade Civil Servants (1963 = 100)[4]	Cost of Living Index - Middle Grade Civil Servants (1970 = 100)[5]	Amalgamated Cost of Living Index - Middle Grade Civil Servants (1963 = 100)[6]
1963	100		100	100.0		100
1964	100		100	102.4		102
1965	108		108	113.2		113
1966	112		112	115.1		115
1967	112		112	119.4		119
1968	115		115	124.5		125
1969	113		113	124.5		125
1970	118	100	118	128.4	100	128
1971	127	104	123	132.5	104	134
1972	135	115	136	141.4	108	139
1973	151	122	144	161.0	120	154
1974	262	166	196	246.6	156	200
1975		229	270		229	294
1976		305	360		250	321
1977		361	426		276	354
1978		432	510		325	417
1979		448	529		377	484
1980		537	634		459	589
1981		675	797		613	787
1982		848	1001		819	1052
1983		1009	1191		1003	1288

Sources: Compiled from

[1] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[2] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[3] Calculated from references listed in [1] and [2].

[4] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[5] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[6] Calculated from references listed in [4] and [5].

TABLE 5.20: NON-FOOD COST OF LIVING INDICES, 1963-1983

Year	Retail Price Index - Wage Earners, DSM (1963 = 100)[1]	Retail Price Index - Wage Earners, DSM (1970 = 100)[2]	Amalgamated Non-food Retail Price Index - Wage Earners, DSM (1963 = 100)[3]	Cost of Living Index - Middle Grade Civil Servants, DSM (1963 = 100)[4]	Cost of Living Index - Middle Grade Civil Servants, DSM (1970 = 100)[5]	Amalgamated Non-food Cost of Living Index - Middle Grade Civil Servants, DSM (1963 = 100)[6]
1963	100.0		100	100.0		100
1964	110.9		111	107.9		108
1965	114.1		114	111.3		111
1966	123.7		124	118.5		119
1967	132.0		132	124.6		125
1968	145.4		145	127.6		128
1969	162.6		163	130.0		130
1970	163.2	100.0	163	130.7	100	131
1971	164.0	100.5	164	138.1	103	135
1972	181.5	111.5	182	147.4	108	141
1973	209.7	129.0	211	154.0	117	153
1974	247.2	155.5	254	192.9	136	178
1975		278.0	454		167	218
1976		266.5	434		189	247
1977		305.1	497		215	281
1978		330.6	539		261	341
1979		371.1	605		319	417
1980		418.1	682		362	473
1981		577.1	942		469	613
1982		669.7	1093		539	704
1983		918.1	1498		685	895

Sources: Compiled from

[1] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[2] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[3] Calculated from references listed in [1] and [2].

[4] Bank of Tanzania, Economic and Operations Report, (June 1975), 86

[5] Bank of Tanzania, Economic and Operations Report, (June 1984), 90

[6] Calculated from references listed in [4] and [5].

TABLE 5.21: GRAIN STORAGE DEPARTMENT PURCHASES AND SALES OF MAIZE/MTAMA BY PROVINCE, 1949/50-1956/57, (Tons)

Province	1949/50	1950/51	1951/52	1952/53	1953/54	1954/55	1955/56	1956/57
Territory:								
Purchases	15,831	54,840	61,838	39,995	22,386	71,611	116,963	2,977
Sales	111,050	43,424	36,809	74,280	61,219	47,035	7,061	1,614
Net Amount	-95,219	11,416	25,029	-34,285	-38,833	24,576	109,902	1,363
Northern								
% of Terr.Purch	37	48	41	40	43	25	30	11
Purchases	5,785	26,220	25,430	15,840	9,734	17,604	35,665	320
Sales	10,527	4,575	3,630	2,916	7,022	4,207	1,246	4
Net Amount	-4,742	21,645	21,800	12,564	2,712	13,397	34,419	316
S. Hghlds								
% of Terr.Purch	0	6	12	30	6	18	22	0
Purchases	-	3,230	7,598	11,821	1,407	12,743	25,589	-
Sales	1,403	-	317	298	976	3,747	739	-
Net Amount	-1,403	3,230	7,281	11,523	431	8,996	24,850	-
Central								
% of Terr.Purch	3	0	7	1	0	0	3	12
Purchases	429	166	4,432	255	57	-	3,399	359
Sales	12,843	418	139	2,549	15,110	6,396	17	-
Net Amount	-12,414	-252	4,293	-2,294	-15,053	-6,396	3,382	359
Southern								
% of Terr.Purch	44	9	4	0	19	21	3	0
Purchases	6,942	4,952	2,563	198	4,214	15,167	2,937	-
Sales	6,240	7,177	4,937	7,818	3,799	2,579	1,517	-
Net Amount	702	-2,225	-2,374	-7,620	415	12,588	1,420	-
Eastern								
% of Terr.Purch	14	17	16	15	8	12	18	66
Purchases	2,190	9,211	10,105	5,836	1,865	8,329	20,577	1,965
Sales	28,787	15,823	12,531	29,652	16,403	12,610	1,276	1,293
Net Amount	-26,597	-6,612	-2,426	-23,816	-14,538	-4,281	19,301	672
Tanga								
% of Terr.Purch	0	11	5	0	5	0	8	11
Purchases	38	6,070	3,362	8	1,093	294	9,303	324
Sales	24,513	9,872	12,200	21,123	7,840	14,270	1,363	308
Net Amount	-24,475	-3,802	-8,838	-21,115	-6,747	-13,976	7,940	16
Lake								
% of Terr.Purch	0	3	3	11	0	6	3	0
Purchases	-	1,913	2,026	4,401	1	3,981	3,073	-
Sales	20,177	3,127	2,238	8,317	8,958	2,992	842	-
Net Amount	-20,177	-1,214	-212	-3,916	-8,957	989	2,231	-
Western								
% of Terr.Purch	3	6	10	5	18	19	14	0
Purchases	447	3,078	6,322	1,996	4,015	13,493	16,420	9
Sales	6,560	2,432	817	1,607	1,111	234	61	-
Net Amount	-6,113	646	5,505	389	2,904	13,259	16,359	9

Source: Compiled from

Tanganyika, Grain Storage Department, Annual Report of the Grain Storage Department, July 1956-July 1957, (DSM, Government Printer, 1957), 14

TABLE 5.22: NAPB/NMC MAIZE PURCHASES BY REGION, 1963/64-1972/73 (Tons)

Region	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
National Total:										
Purchases	108,890	80,430	69,550	107,820	105,125	130,181	47,000	186,400	43,000	106,400
Sales		83,800	89,500	74,800	93,100	104,500	123,400	116,600	160,000	154,000
Balance		-3,370	-19,950	33,020	12,025	25,681	-76,400	69,800	-117,000	-47,600
Arusha	16,630	18,340	3,263	16,840	24,400	18,821	12,800	45,100	7,600	17,100
% of Total	15	23	5	16	23	14	27	24	18	16
Kilimanjaro	12,670	1,870	391	15,980	14,880	13,397	13,900	16,000	2,900	11,800
% of Total	12	2	1	15	14	10	30	9	7	11
Northern Area %	27	25	5	30	37	25	57	33	24	27
Mbeya	1,740	3,120	1,381	3,180	730	1,213	300	2,500	200	100
% of Total	2	4	2	3	1	1	1	1	0	0
Iringa	32,880	32,500	29,654	25,440	25,800	28,154	3,200	36,500	7,700	8,200
% of Total	30	40	43	24	25	22	7	20	18	8
S.Hghlds Area %	32	44	45	27	25	23	7	21	18	8
Dodoma	21,870	12,450	20,794	26,570	18,200	43,940	400	58,600	15,600	54,100
% of Total	20	15	30	25	17	34	1	31	36	51
Singida	-	850	809	4,770	2,530	1,162	0	5,400	1,000	700
% of Total	0	1	1	4	2	1	0	3	2	1
Central Area %	20	17	31	29	20	35	1	34	39	52
Ruvuma	2,040	30	2,776	2,850	1,545	665	1,000	1,700	0	500
% of Total	2	0	4	3	1	1	2	1	0	0
Lindi	-	-	-	-	-	-	-	-	-	-
% of Total										0
Mtwara	1,380	0	250	0	245	-	400	0	0	0
% of Total	1	0	0	0	0	0	1	0	0	0
Southern Area %	3	0	4	3	2	1	3	1	0	0
Morogoro	11,600	5,530	7,826	5,140	4,570	6,700	3,800	6,700	3,900	9,600
% of Total	11	7	11	5	4	5	8	4	9	9
Coast	50	30	0	330	0	0	0	0	0	0
% of Total	0	0	0	0	0	0	0	0	0	0
Eastern Area %	11	7	11	5	4	5	8	4	9	9
Tanga	2,850	890	352	2,830	2,705	2,483	900	900	100	0
% of Total	3	1	1	3	3	2	2	0	0	0
Tanga Area %	3	1	1	3	3	2	2	0	0	0
Shinyanga	0	710	0	0	1,110	3,093	0	200	1,400	0
% of Total	0	1	0	0	1	2	0	0	3	0
Kagera	250	120	0	80	0	0	0	0	0	0
% of Total	0	0	0	0	0	0	0	0	0	0
Mwanza	0	0	0	190	20	489	600	1,300	100	200
% of Total	0	0	0	0	0	0	1	1	0	0
Mara	2,010	1,830	447	2,700	5,830	7,777	8,400	10,000	1,600	3,600
% of Total	2	2	1	3	6	6	18	5	4	3
Lake Area %	2	3	1	3	7	9	19	6	7	3

TABLE 5.22: CONTINUED

Region	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Kigoma	370	320	398	190	130	37	0	200	0	0
% of Total	0	0	1	0	0	0	0	0	0	0
Tabora	2,550	1,840	1,201	730	2,430	2,250	1,300	1,300	900	500
% of Total	2	2	2	1	2	2	3	1	2	0
Rukwa	-	-	-	-	-	-	-	-	-	-
% of Total Western Area %	3	3	2	1	2	2	3	1	2	0

Sources: NAPB figures quoted in

1) Kreisel et al., Agricultural Marketing, 21
2) Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II, DSM, (1977), Tables A 1.17 and A 1.36
3) Tanzania, MDB, 'Price Policy Recommendations', Vol. I: Maize, Rice and Wheat, (DSM, 1981), Appendix 2.1

TABLE 5.23: NAPB/NMC RICE AND PADDY PURCHASES BY REGION, 1963/64-1972/73, (Rice Equivalent[1] Tons)

Region	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
National Total										
Purchases	-	24,516	12,880	24,310	19,630	29,705	38,870	60,800	44,600	47,500
Sales	-	22,153	23,600	31,700	34,400	35,200	41,800	52,100	75,800	88,000
Balance	-	2,363	-10,720	-7,390	-14,770	-5,495	-2,930	8,700	-31,200	-40,500
Arusha				0	0	0	0	0	0	0
% of Total										
Kilimanjaro				845	130	715	2,145	2,210	2,340	5,135
% of Total				3	1	2	7	4	5	11
Northern Area %				3	1	2	7	4	5	11
Mbeya				8,320	7,995	4,550	10,335	12,480	14,365	11,830
% of Total				34	41	15	35	21	32	25
Iringa				0	585	455	585	1,300	780	455
% of Total				0	3	2	2	2	2	1
S.Hghlds Area %				34	44	17	37	23	34	26
Dodoma				0	0	0	0	0	0	520
% of Total										1
Singida				0	0	0	0	0	0	325
% of Total										1
Central Area %				0	0	0	0	0	0	2
Ruvuma				65	65	0	0	0	195	65
% of Total				0	0	0	0	0	0	0
Mtwara				65	195	0	260	0	325	130
% of Total				0	1	0	1	0	1	0
Lindi				-	-	-	-	-	-	-
% of Total										
Southern Area %				0	1	0	1	0	1	0
Morogoro				1,560	3,380	1,170	1,430	3,185	6,630	6,435
% of Total				6	17	5	5	5	15	14
Coast/DSM				2,990	2,145	0	65	0	3,055	2,600
% of Total				12	11	0	0	0	7	5
Eastern Area %				19	28	5	5	5	22	19
Tanga				520	0	65	520	0	260	1,755
% of Total				2	0	0	2	0	1	4
Tanga Area %				2	0	0	2	0	1	4
Shinyanga				910	2,340	3,250	1,300	4,095	1,950	9,360
% of Total				4	12	11	4	7	4	20
Kagera				0	0	0	0	0	0	0
% of Total										
Mwanza				910	585	2,535	6,175	12,675	1,820	1,560
% of Total				4	3	9	21	21	4	3
Mara				455	845	1,820	2,665	5,590	2,470	1,235
% of Total				2	4	6	9	9	6	3
Lake Area %				9	19	26	35	37	14	26

TABLE 5.23: CONTINUED

Region	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Kigoma				195	195	195	0	910	455	65
% of Total				1	1	1	0	1	1	0
Tabora				7,345	845	14,950	3,900	17,420	9,945	6,110
% of Total				30	4	50	13	29	22	13
Rukwa				-	-	-	-	-	-	-
% of Total										
Western Area %				31	5	51	13	30	23	13

Sources: NAPB figures quoted in

1) Livingstone, I., 'Production, Price and Marketing Policy for Staple Foodstuffs in Tanzania', ERB Paper 71.16, 32
2) Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II, DSM, (1977), Table A 1.22 and A 1.37
3) Tanzania, MDB, 'Price Policy Recommendations', Vol. I: Maize, Rice and Wheat, (DSM, 1981), Appendix 3.1

[1] Note 1 ton paddy = 0.65 ton rice.

TABLE 5.24: NAPB/NMC WHEAT PURCHASES BY REGION, 1965/66-1973/74 (Tons, Wheat Equivalent[1])

Region	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
National Total								
Purchases	29,000	28,000	33,000	23,300	24,600	43,000	56,800	46,900
Sales	38,900	40,000	50,600	60,100	56,700	59,700	88,600	53,900
Balance	-9,900	-12,000	-17,600	-36,800	-32,100	-16,700	-31,800	-7,000
Arusha				19,700	19,100	29,900	40,200	36,300
% of Total				85	78	70	71	78
Kilimanjaro				1,800	3,400	9,500	10,800	6,300
% of Total				8	14	22	19	13
Northern Area %				92	91	92	90	91
Mbeya				1,400	200	500	400	500
% of Total				6	1	1	1	1
Iringa				400	800	1,500	2,700	2,400
% of Total				2	3	3	5	5
S.Hghlds Area %				8	4	5	5	6
Dodoma				0	0	0	0	0
% of Total								
Singida				0	0	0	0	0
% of Total								
Central Area %				0	0	0	0	0
Ruvuma				0	100	200	400	0
% of Total				0	0	0	1	0
Lindi				-	-	-	-	-
% of Total								
Mtwara				0	0	0	0	0
% of Total								
Southern Area %				0	0			
Morogoro				0	0	0	0	0
% of Total								
Coast/DSM				0	0	0	0	0
% of Total								0
Eastern Area %				0	0	0	0	0
Tanga				0	0	0	0	0
% of Total								
Tanga Area %				0	0	0	0	0

TABLE 5.24: CONTINUED

Region	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Shinyanga				0	0	0	0	0
% of Total								
Kagera				0	0	0	0	0
% of Total								
Mwanza				0	0	0	0	0
% of Total								
Mara				0	0	0	0	0
% of Total								
Lake Area %				0	0	0	0	0
Kigoma				0	0	0	0	-
% of Total								
Tabora				0	500	1,400	2,200	1,300
% of Total					2	3	4	3
Rukwa				-	-	-	-	-
% of Total								
Western Area %				0	2	3	4	3

Sources: Compiled from
Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II DSM, (1977), Table A1.27 & A1.38

TABLE 5.25: TRANSPORT STATISTICS, 1950-1970

	RAIL						ROAD		
	Freight Volume in 1000 tons			Transport Volume in 1000 ton-miles			Total Number of:		
Year	Central line	Tanga line	Total	Central line	Tanga line	Total	Motor Vehicles	Motor Cars	Lorries and Buses
1950	406	183	589	n.a.	n.a.	n.a.	15,294	4,361	5,606
1955	777	354	1,131	n.a.	n.a.	n.a.	26,421	9,184	6,573
1960	757	n.a.	n.a.	326,700		n.a.	39,968	15,994	7,207
1965	930	406	1,336	416,330	53,842	470,172	54,422	23,360	8,596
1970	n.a.	n.a.	n.a.			600,000	85,427	33,574	14,059

Source:

Hofmeier, R., Transport and Economic Development, (Munich, Weltforum Verlag, 1973), 321,327

TABLE 5.26: VALUE OF NET IMPORT/EXPORT, 1922-1983 (TShs. '000,000)

Year	Imports	Exports	Balance	Year	Imports	Exports	Balance	Year	Imports	Exports	Balance
1922	27.7	26.0	- 1.7	1951	562.4	786.9	224.5	1973	3139.5	2238.3	- 901.2
1923	35.9	33.0	- 2.9	1952				1974	5429.7	2537.4	-2892.3
1924	41.3	51.6	10.3	1953	568.5	690.9	122.4	1975	5288.1	2548.6	-2739.5
1925	57.3	57.2	- 0.1	1954	639.2	725.0	85.8	1976	4751.8	3815.0	- 936.8
1926	63.0	59.9	- 3.2	1955	870.6	723.8	-146.8	1977	6161.3	4393.8	-1767.5
1927	73.4	65.2	- 8.2	1956	717.7	896.1	178.4	1978	8797.7	3631.7	-5166.0
1928	74.7	76.3	1.6	1957	785.5	789.5	40.0	1979	8941.0	4313.2	-4627.8
1929	85.7	73.7	- 12.0	1958	671.4	834.1	162.7	1980	10210.5	4700.0	-9740.5
1930	79.7	51.8	- 27.9	1959	689.1	905.7	216.6	1981	9739.5	4705.8	-5033.7
1931	49.9	31.7	- 18.2	1960	756.3	1096.5	340.2	1982	10529.7	4143.9	-6385.8
1932	37.4	40.6	3.2	1961	793.7	973.0	179.3	1983	8876.5	4138.6	-4737.9
1933	38.9	46.9	8.0	1962	796.3	1024.8	228.5				
1934	46.9	47.0	0.1	1963	808.4	1271.1	462.7				
1935	59.8	61.5	1.7	1964	879.5	1402.2	522.7				
1936	67.1	80.5	13.4	1965	1000.9	1255.6	254.7				
1937	78.5	88.9	10.4	1966	1285.0	1582.1	297.1				
1938	69.0	38.4	- 30.6	1967	1300.5	1553.6	253.1				
1939	60.8	38.3	- 22.5	1968	1531.7	1585.4	53.7				
1940	60.0	79.4	19.4	1969	1418.8	1666.8	248.0				
1941	73.1	89.6	16.4	1970	1939.2	1688.7	-250.5				
1942	73.8	121.6	47.8	1971	2414.4	1735.4	-679.0				
1943	92.5	108.1	15.6	1972	2597.6	2027.2	-570.4				
1944	112.8	139.4	26.6								
1945	134.9	154.5	19.6								
1946	162.5	169.2	6.7								
1947	274.5	214.7	- 59.8								
1948	451.5	314.6	-136.9								
1949	551.5	384.7	-166.8								
1950	480.0	475.4	- 4.6								

Sources:

1) Tanganyika Blue Books, 1922-1948
2) East African Annual Trade Reports, 1949-1976
3) Tanzania Annual Trade Reports, 1977-1983

TABLE 6.1: GOVERNMENT EMPLOYMENT AND WAGE BILL, 1965-1978

Year	Employment Central Government	Local Government	Total	% of Total Wage Employment	Wage Bill: (Million TShs). Central Government	Local Government	Total	Monthly Cash Earnings per Capita(TSh)
1965	60,351	29,561	89,912	27	232.2	82.0	314.2	291
1966	65,708	31,956	97,564	29	262.4	95.7	358.1	306
1967	80,239	29,433	109,672	32	272.2	100.5	372.7	283
1968	88,327	31,371	119,698	34	298.0	114.0	412.0	287
1969	94,050	36,896	130,946	36	322.4	133.0	455.4	290
1970	95,318	39,562	134,880	36	360.3	162.5	522.8	323
1971	99,564	39,110	138,674	35	374.6	169.9	544.5	327
1972	101,182	41,127	142,309	35	415.8	179.4	595.2	349
1973	129,832	25,389	155,221	33	619.7	125.1	744.8	400
1974	167,665	10,679	178,344	37	1200.8	71.7	1272.5	595
1975	148,298	-	148,298	31	1039.1	-	1039.1	584
1976	146,780	-	146,780	31	1062.7	-	1062.7	603
1977	158,493	-	158,493	33	1181.0	-	1181.0	621
1978	186,246	-	186,246	35	1468.5	-	1468.5	657

Sources:

Tanganyika, Central Statistical Bureau, Survey of Employment and Earnings 1968, 6,10; 1975-1976, 5,7; 1977-1978, 7,10

TABLE 6.2: ANNUAL REVENUE AND EXPENDITURE OF TANGANYIKA, 1972/73-1982/83

Year	Total Recurrent Revenue (TShs.'000)	Total Recurr. & Development Expenditure (TShs.'000)	Net Revenue/ Expenditure (TShs.'000)	Total Expenditure per Capita (TShs.)	% of Total Central Government Expenditure assigned to: Health	Educ.	P.W.D.	Agric.°	Industry	Civil Order & External Defence	Reg'l Admin.
1972/73	2,356,600	3,182,200	- 825,600	226.60	6.5	13.3	11.7	10.1	2.2	15.3	n.a.
1973/74	3,022,900	4,427,200	- 1,404,300	305.20	6.6	12.3	5.4	11.8	1.7	17.0	24.5
1974/75	3,946,000	6,185,700	- 2,239,700	413.00	6.9	12.2	4.7	15.3	4.1	17.3	23.2
1975/76	3,918,500	5,968,200	- 2,049,700	385.80	7.1	14.1	6.4	14.2	1.9	17.3	24.0
1976/77	6,129,000	7,946,800	- 1,817,800	497.50	7.1	13.6	6.6	11.6	7.4	17.1	14.6
1977/78	6,082,100	8,894,100	- 2,812,000	539.10	7.3	14.4	5.5	9.3	8.7	19.7	21.4
1978/79	6,612,000	13,035,400	- 6,423,400	765.10	5.4	11.7	7.2	7.0	6.4	28.0	18.7
1979/80	7,757,300	14,413,000	- 6,655,700	819.20	5.8	13.1	8.9	10.7	11.4	13.5	18.6
1980/81*	8,872,000	14,895,000	- 6,023,000	819.80	5.5	12.1	9.3	10.1	8.8	16.2	17.1
1981/82*	9,783,000	18,629,000	- 8,846,000	992.90	5.2	12.9	8.4	7.4	8.3	17.0	15.7
1982/83**	10,700,000	18,960,000	- 8,260,000	978.50	5.4	13.3	6.4	7.7	6.5	12.8	16.9

Sources: Compiled from
1972/73-1975/76 - Tanganyika, The Economic Survey, 1977-78, (DSM, Government Printer, n.d.), Tables 16-18
1976/77-1982/83 - Tanzania, The Economic Survey, 1982, (DSM, Government Printer, 1983), 41-45

* Provisional actual total.
** Approved estimate not actual expenditure.
° Public Works Department

TABLE 6.3: VALUE AND VOLUME OF FUEL IMPORTS, 1963-1983 (1963=100)

Year	Fuel Imports as % of Total Imports[1]	Value of Fuel Imports (m. TShs.)[1]	Value of Fuel Imports (m. U.S.$)[2]	Fuel Unit Value Index[3]	Crude Oil Imports[4]	Fuel Volume Index (1970=100)	M.U.V. Index[5]	Weighted M.U.V. + Fuel Index[6]
1963	5*			100			100	100
1964	5	49.5	6.88	100			101	101
1965	3	28.9	4.01	100			104	104
1966	5	68.3	9.49	100	287.1	39	105	105
1967	8	105.1	14.60	100	671.3	92	106	106
1968	9	133.1	18.37	100	752.1	103	106	106
1969	9	137.4	19.06	100	626.9	86	109	109
1970	8	156.6	21.78	101	731.7	100	116	115
1971	9	209.0	29.42	131	944.3	129	122	123
1972	9	231.8	32.21	148	814.9	111	131	132
1973	11	331.3	46.98	197	811.0	111	154	158
1974	11	533.3	74.29	722	859.7	117	188	236
1975	11	591.1	82.34	716	737.5	101	212	263
1976	17	792.6	93.56	762	810.3	111	212	266
1977	14	847.6	101.66	776	675.1	92	232	287
1978	12	1039.8	132.52	771	657.4	90	266	324
1979	14	1252.4	151.29	1138	570.7	78	306	388
1980	23	2357.7	286.50	1876	694.2	95	337	476
1981	25	2530.7	303.08	2206	466.1	64	320	479
1982	22	2352.4	247.67	2031	577.6	79	310	460
1983	21	1762.8	144.00	1769	539.9	74		

Sources: Compiled from

[1] Bank of Tanzania, Economic and Operations Report, (June 1984), B3

[2] Calculated on the basis of the TSh./$ exchange rate in June of each year (Bank of Tanzania). Between 1963 and 1967 Bank of Tanzania figures are not available. The rate is calculated at TShs. 7.20 = $1.00.

[3] Kuwait f.o.b. oil export prices are used as the basis of this index. I could not find a world oil price index that predated 1972. As a proxy the Kuwait f.o.b. oil export prices is fairly good. Comparing the index of crude petroleum world export prices (United Nations, Monthly Bulletin of Statistics, assorted issues) and Kuwait oil f.o.b. prices with 1974 as a base year gives values of 325 and 306 respectively in 1981. Note between 1963 and 1970 the Kuwaiti oil price was perfectly stagnant at $1.59-1.60 per barrel.

[4] 1966-1971 source: Tanzania, Bureau of Statistics, Selected Statistical Series 1951-1985, (DSM, 1987); 1972-1983 source: Tanzania Petroleum Corporation

[5] Industrial countries' manufactured goods unit value export index (MUV) (United Nations, Statistical Yearbook, various years).

[6] Compiled index using the industrial countries' manufactured goods unit value index as a base with the petroleum unit value index weighted according to fuel's proportional rise in total Tanzanian imports. Sources as in 3) and 5).

* Estimated

TABLE 6.4: PARASTATAL ENTERPRISE GROWTH, 1966-1980

Year	No. of Parast'ls	Employment	% of Total Wage Employment	Wages & Salaries (Shs'000)	Net Monthly Earnings per Employee	Operating Profit (Shs'000,000)	Corporation Tax (Shs'000,000)	Government Subsidies (Shs'000,000)	Survey Response Rate (%)
1966	43	18,601	5	88,843	398	71.1	44.6	3.5	81
1967	64	26,292	8	162,500	515	206.0	152.8	2.3	88
1968	73	34,690	10	237,593	571	132.2	113.9	3.1	90
1969	78	49,925	14	282,664	472	162.0	149.3	0.6	100
1970	85	54,613	15	340,180	519	112.5	137.4	14.2	>80
1971	99	67,880	17	391,047	480	204.4	196.7	5.5	>80
1972	111	68,429	17	466,400	568	256.0	248.3	10.3	83
1973	121	70,492	15	555,200	656	344.1	272.8	14.1	74
1974	144	80,057	17	687,600	716	273.7	365.2	90.9	80
1975	147	82,374	17	734,600	743	548.3	330.1	309.7	76
1976	150	92,269	19	829,200	749	570.6	384.3	61.5	77
1977	160	105,875	22	928,300	731	862.7	583.1	52.7	75
1978	163	128,929	24	1,432,600	926	1392.2	756.7	97.0	73
1979	176	150,261	25	1,664,500	923	975.6	944.1	54.8	67
1980	190	153,623	25	1,946,500	1056	1942.9	1145.8	86.1	70

Source: Tanzania, Bureau of Statistics, Analysis of Accounts of Parastatals (1976), 2-4; (1983), 2-9

Year	% of Total Monetary Capital Formation	% Contribution to Monetary GDP
1964	7	
1965	5	
1966	11	3
1967	23	7
1968	23	7
1969	14	8
1970	35	8
1971	45	14[1]
1972	53	15
1973	46	15
1974	34	13
1975	30	15
1976	22	19
1977	18	17
1978	21	19
1979	16	18
1980	19	22
1981	18	
1982	20	

Sources:

1) Tanzania, The Economic Survey 1971-72, (DSM, Government Printer, 1972), 5, 12
2) Tanzania, The Economic Survey 1982, (DSM, Government Printer, 1983), 24
3) Tanzania, Hali wa Uchumi wa Taifa katika 1982, (DSM, Government Printer, 1983), 9a
4) Tanzania, Bureau of Statistics, Analysis of Accounts of Parastatals (1976), 5; (1983), 13

[1] Note the large increase has to be partially attributed to more than a 25% discrepancy in the listed monetary GDP for 1971 between two time series listed in refences 1) and 3).

TABLE 6.5: PARASTATAL INVESTMENT, 1966-1980 (TShs'000,000)

			Sources of Investment Finance: (as % of Total Investment)							
Year	Total Investment	Negative Cash Balance	Govt. Loans	Govt. Grants	Foreign Loans	Foreign Grants	Local Borrowing	Profit Retained	Depreciation Provision	Others & Cash Balances
1966	140.8		3	6	4	6	3	33	20	25
1967	398.8		14	5	6	0	16	16	13	30
1968	472.2	-33.4	10	11	27	0	16	26	17	-7
1969	507.9		7	6	5	3	19	23	17	19
1970	1138.6		7	13	2	1	39	11	10	18
1971	1096.3		8	6	23	-	33	17	12	1
1972	1555.3*		6	10	15	0	31	15	9	13
1973	1832.0*		3	12	6	0	43	19	9	7
1974	2008.3*	-569.4	8	12	6	1	81	11	10	-28
1975	3396.7	-209.6	8	15	5	1	52	19	6	-6
1976	4546.7	-446.5	9	7	4	4	62	18	5	-10
1977	3723.6	-1548.3	4	17	4	4	78	26	8	-42
1978	3307.3	-2844.6	1	16	19	9	84	44	13	-86
1979	3152.5	-1042.5	6	13	17	3	51	25	17	-33
1980	5401.4	-3403.5	4	12	5	2	99	31	6	-63

Sources: Tanzania, Bureau of Statistics, Analysis of Accounts of Parastatals (1976), 7; (1983), 17

TABLE 6.6: NOMINAL AND REAL UNIT EXPORT VALUE OF COFFEE, COTTON AND SISAL, 1963-1984 (1963=100)

	NOMINAL:[1]			REAL:[2]			REAL:[3]		
Year	Coffee	Cotton	Sisal	Coffee	Cotton	Sisal	Coffee	Cotton	Sisal
1963	100	100	100	100	100	100	100	100	100
1964	143	99	99	142	98	98	142	98	98
1965	131	99	64	126	95	62	126	95	62
1966	129	92	57	123	88	54	123	88	54
1967	115	94	47	109	89	44	109	89	44
1968	121	102	40	114	96	38	114	96	38
1969	113	94	44	104	86	40	104	86	40
1970	151	93	38	131	80	33	132	81	33
1971	140	102	38	115	83	32	114	83	31
1972	152	119	44	116	91	33	115	90	33
1973	179	126	92	116	82	60	113	80	58
1974	199	219	231	106	116	123	84	93	98
1975	193	177	141	91	84	66	73	67	54
1976	481	253	130	227	119	61	181	95	49
1977	859	304	159	370	131	69	299	106	55
1978	554	204	129	208	77	49	171	63	40
1979	580	288	248	190	94	81	149	74	64
1980	584	288	241	173	85	72	123	61	51
1981	506	331	225	158	103	70	106	69	47
1982	503	307	215	162	99	69	109	67	47
1983	620	394	250						
1984	921	592	253						

Sources:

[1] Tanzania, Annual Trade Reports, assorted years

[2] As above deflated by industrial countries' manufactured goods unit value export index (United Nations, Statistical Yearbook, annual), (see TABLE 6.3)

[3] As in [1] deflated by a compiled M.U.V. + fuel index (see TABLE 6.3).

TABLE 6.7: PEASANT INCOME INDEX, 1952-1981 (1963=100)

Year	Estimated Real Income of Commerical Cotton Producer[1]	Estimated Real Income of Commercial Maize Producer[2]
1952	99	
1953	101	
1954	116	
1955	117	
1956	119	93
1957	105	84
1958	103	86
1959	101	80
1960	103	69
1961	109	96
1962	104	99
1963	100	100
1964	98	87
1965	93	94
1966	88	81
1967	87	84
1968	87	83
1969	86	75
1970	87	78
1971	86	61
1972	81	71
1973	79	69
1974	69	69
1975	66	68
1976	69	77
1977	65	71
1978	65	69
1979	64	67
1980	65	67
1981	61	61

Sources: Compiled from

[1] Assumes 40% of income derives from subsistence production and is not subject to price changes, whereas the rest of the farmer's income is solely derived from sale of cotton produce. Cotton prices are deflated by the Non-Food Retail Price Index for Dar es Salaam (1963=100).
Cotton Prices: 1952-1968: Helleiner, G.K., 'Agricultural Marketing in Tanzania: Policies and Problems', ERB Paper 68.14, UDSM, (1968), 25
1969-1974: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister and Second Vice-President, (1974), Annex Table No. I.10
1975-1984: Tanzania, MDB, 'Price Policy Recommendations for the July 1982 Agricultural Price Review: Summary', DSM, (July 1982), Appendix 7

[2] Assumes 40% of income derives from subsistence production and is not subject to price changes, whereas the rest derives from sale of maize. Maize prices are deflated by the Non-Food Retail Price Index for Dar es Salaam (1963=100).

Maize Prices: 1956-1969: Kriesel, H.C. et al., Agricultural Marketing in Tanzania: Background Research and Policy Proposals, (East Lansing, Michigan State University, 1970), 38;

1970-1974: Odegaard, K., 'A Study of Agricultural Producer Prices', Office of the Prime Minister, (1974), Annex Table I.4

1975-1986: Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review: Summary, (1984), Appendix IV

TABLE 6.8: NMC MAIZE AND SEMBE PURCHASES AND SALES, 1973/74-1983/84 ('000 Tons, Maize Equivalent[1])

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
National											
Purchases	73.8	23.9	91.1	127.5	213.2	220.4	161.1	104.6	89.4	68.7	71.0
Sales	209.7	202.7	137.8	125.8	103.3	156.0	223.0	295.0	287.0	208.3	244.3
Balance	-135.9	-178.8	-46.7	1.7	109.9	64.4	-61.9	-190.4	-197.6	-139.6	-173.3
Arusha											
% of Nat'l Purch.	9	12	11	12	28	32	29	17	4	1	9
Purchase	7.0	2.9	10.1	14.8	60.3	69.5	47.4	17.4	3.2	1.0	6.3
Sales						4.0	16.0	17.0	10.0	7.9	8.7
Balance						65.5	31.4	-0.4	-6.8	-6.9	-2.4
Kilimanjaro											
% of Nat'l Purch.	8	20	5	5	11	6	4	0	0	1	0
Purchase	6.0	4.8	4.8	6.1	22.9	13.6	5.9	0.1	0.0	0.0	0.1
Sales						2.0	8.0	10.0	6.0	2.0	7.0
Balance						11.6	-2.1	-9.9	-6.0	-2.0	-6.9
Mbeya											
% of Nat'l Purch.	2	3	2	4	5	3	4	5	8	12	11
Purchase	1.4	0.7	2.2	5.5	11.7	7.2	6.4	5.4	7.2	8.0	7.7
Sales						2.0	2.0	3.0	1.0	3.3	3.2
Balance						5.2	4.4	2.4	6.2	4.7	4.5
Iringa											
% of Nat'l Purch.	15	17	12	12	10	12	16	21	37	29	35
Purchase	11.2	4.1	10.5	14.7	20.9	27.2	26.3	21.8	33.1	20.0	25.1
Sales						4.0	7.0	6.0	6.0	5.2	8.6
Balance						23.2	19.3	15.8	27.1	14.8	16.5
Dodoma											
% of Nat'l Purch.	47	0	7	9	8	17	17	23	5	1	7
Purchase	34.5	0	6.0	11.5	17.8	37.0	27.1	23.7	4.4	1.0	5.3
Sales						5.0	15.0	16.0	30.0	21.6	17.6
Balance						32.0	12.1	7.7	-25.6	-20.6	-12.3
Singida											
% of Nat'l Purch.	2	0	1	1	0	2	0	0	0	0	0
Purchase	1.6	0	0.5	1.1	1.0	3.6	0.7	0.4	0.2	0.0	0.1
Sales						2.0	7.0	2.0	2.0	0.7	2.5
Balance						1.6	-6.3	-1.6	-1.8	-0.7	-2.4
Ruvuma											
% of Nat'l Purch.	0	18	14	8	8	10	11	13	24	26	18
Purchase	0.1	4.2	12.7	10.0	16.1	22.7	17.8	14.0	21.1	18.0	12.9
Sales						0.3	1.0	1.0	1.0	0.6	1.1
Balance						22.4	16.8	13.0	20.1	17.4	11.8
Lindi											
% of Nat'l Purch.	0	0	1	2	1	1	0	0	0	0	0
Purchase	0	0	1.2	2.7	3.0	2.0	0.0	0.2	0.4	0.2	0.0
Sales						3.0	5.0	6.0	3.0	2.4	1.3
Balance						-1.0	-5.0	-5.8	-2.6	-2.2	-1.3
Mtwara											
% of Nat'l Purch.	0	0	3	3	1	0	0	0	0	0	0
Purchase	0	0	2.7	4.4	1.8	1.0	0.0	0.2	0.0	0.0	0.0
Sales						4.0	4.0	7.0	6.0	3.5	2.1
Balance						- 3.0	- 4.0	- 6.8	- 6.0	- 3.5	- 2.1

TABLE 6.8: CONTINUED

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Morogoro											
% of Nat'l Purch.	7	4	12	7	7	2	1	1	0	0	0
Purchase	5.4	1.0	10.5	9.2	14.5	5.0	1.1	0.7	0.4	0.3	0.1
Sales						3.0	8.0	8.0	9.0	4.8	5.9
Balance						2.0	-6.9	-7.3	-8.6	-4.5	-5.8
Coast/Dar es Salaam											
% of Nat'l Purch.	0	0	2	2	1	0	0	0	0	0	0
Purchase	0	0	1.5	2.4	2.1	0.7	0.0	0.0	0.0	0.0	0.1
Sales		67.1	58.3	50.7	52.3	88.0	107.0	133.0	137.0	127.8	138.7
Balance		-67.1	-56.8	-48.3	-50.2	- 87.3	-107.0	-133.0	-137.0	-127.8	-138.6
Tanga											
% of Nat'l Purch.	0	13	22	16	3	3	0	0	1	1	1
Purchase	0	3.8	20.2	20.8	7.2	7.3	0.4	0.1	1.3	0.6	1.0
Sales						15.0	26.0	31.0	13.0	3.7	6.2
Balance						-7.7	-25.6	-30.9	-11.7	-3.1	-5.2
Shinyanga											
% of Nat'l Purch.	0	0	1	0	1	1	1	0	0	0	0
Purchase	0	0	0.7	0.0	2.5	2.4	1.1	0.2	0.2	0.2	0.1
Sales						1.0	2.0	12.0	14.0	6.0	10.5
Balance						1.4	-0.9	-11.8	-13.8	-5.8	-10.4
Kagera											
% of Nat'l Purch.	0	0	0	1	1	0	0	0	0	0	1
Purchase	0	0	0.2	1.1	1.3	0.8	0.7	0.0	0.0	0.0	0.4
Sales						13.0	2.0	7.0	4.0	2.8	4.3
Balance						-12.2	-1.3	-7.0	-4.0	-2.8	-3.9
Mwanza											
% of Nat'l Purch.	1	0	3	1	1	2	1	0	0	0	0
Purchase	0.4	0	2.9	1.3	2.4	4.2	2.0	0.0	0.0	0.0	0.0
Sales						6.0	5.0	15.0	19.0	5.6	6.9
Balance						-1.8	-3.0	-15.0	-19.0	-5.6	-6.9
Mara											
% of Nat'l Purch.	8	7	1	5	3	2	2	0	0	0	2
Purchase	6.2	1.7	1.1	5.9	5.5	4.2	3.0	0.0	0.3	0.2	1.1
Sales						2.0	3.0	11.0	11.0	6.1	4.2
Balance						2.2	0.0	-11.0	-10.7	-6.9	-3.1
Kigoma											
% of Nat'l Purch.	0	0	0	1	0	0	0	0	0	0	0
Purchase	0	0	0.2	0.7	0.9	1.0	0.4	0.2	0.4	0.2	0.3
Sales						0.4	1.0	1.0	2.0	1.4	3.0
Balance						0.6	-0.6	-0.8	-1.6	-1.2	-2.7
Tabora											
% of Nat'l Purch.	0	0	0	3	5	3	3	2	1	1	0
Purchase	0	0	0.1	3.5	10.0	5.8	4.9	2.4	1.2	1.0	0.3
Sales						1.0	2.0	5.0	9.0	2.4	8.5
Balance						4.8	2.9	-2.6	-7.8	-1.4	-8.2
Rukwa											
% of Nat'l Purch.	0	3	3	9	4	2	10	17	18	26	14
Purchase	-	0.7	3.0	11.8	8.5	5.2	15.9	17.8	16.0	18.0	10.1
Sales						1.0	2.0	4.0	4.0	0.5	4.2
Balance						4.2	13.9	13.8	12.0	17.5	5.9

Sources: Compiled from

1) Tanzania, MDB, 'Price Policy Recommendations', Vol. I: Maize, Rice and Wheat, (DSM, 1981:Appendices 2.1 and 2.3; 1983:46 and 1984:52-53)
2) Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II, DSM, (1977), A1.36

[1] Note sembe maize flour included in maize sales total. When MDB has not specified a maize equivalent, I have calculated sembe at a 95% extraction rate: 1 ton maize = 0.95 sembe.

TABLE 6.9: NMC PADDY AND RICE PURCHASES AND SALES, 1973/74-1983/84, ('000 Tons, Rice Equivalent)

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
National											
Purchases	38.7	14.8	11.9	15.1	35.1	33.0	29.0	13.0	15.0	20.9	22.0
Sales	82.3	42.9	34.7	52.3	74.6	70.1	61.3	77.6	77.8	71.9	79.1
Balance	-43.6	-28.1	-22.8	-37.2	-39.5	-37.1	-32.3	-64.6	-62.8	-51.0	-57.1
Arusha											
% of Nat'l Purch.	0	0	0	0	1	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Sales						6.2	2.6	4.1	3.4	1.8	1.6
Balance						- 6.2	- 2.6	- 4.1	- 3.4	- 1.8	- 1.6
Kilimanjaro											
% of Nat'l Purch.	2	6	1	2	4	3	0	0	1	0	1
Purchase	0.8	0.9	0.1	0.3	1.5	1.0	0.0	0.0	0.1	0.1	0.2
Sales						2.5	1.7	3.5	1.7	2.9	1.3
Balance						-1.5	-1.7	-3.5	-1.6	-2.8	-1.1
Mbeya											
% of Nat'l Purch.	19	45	63	62	53	45	41	85	93	74	75
Purchase	7.5	6.6	7.5	9.4	18.6	15.0	12.0	11.0	14.0	15.4	16.4
Sales						1.7	0.8	0.7	1.7	1.8	3.9
Balance						13.3	11.2	10.3	12.3	13.6	12.5
Iringa											
% of Nat'l Purch.	0	3	3	0	0	0	0	0	0		
Purchase	0.1	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.6	1.2	1.5	1.6	1.1	1.4
Balance						-1.6	-1.2	-1.5	-1.6	-1.1	-1.4
Dodoma											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						2.3	1.4	3.2	2.8	2.7	1.6
Balance						-2.3	-1.4	-3.2	-2.8	-2.7	-1.6
Singida											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						0.8	0.4	0.2	0.3	0.2	0.5
Balance						-0.8	-0.4	-0.2	-0.3	-0.2	-0.5
Ruvuma											
% of Nat'l Purch.	0	0	0	2	1	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Sales						0.9	1.2	0.7	0.3	0.7	0.6
Balance						-0.9	-1.2	-0.7	-0.3	-0.7	-0.5
Lindi											
% of Nat'l Purch.	0	0	0	2	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.6	1.3	1.6	1.3	0.7	1.0
Balance						-1.6	-1.3	-1.6	-1.3	-0.7	-1.0
Mtwara											
% of Nat'l Purch.	0	0	0	2	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.7	1.2	2.4	1.4	0.8	0.7
Balance						-1.7	-1.2	-2.4	-1.4	-0.8	-0.7

TABLE 6.9: CONTINUED

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Morogoro											
% of Nat'l Purch.	4	5	13	7	8	6	0	0	1	15	13
Purchase	1.4	0.7	1.5	1.1	2.8	2.0	0.0	0.0	0.2	3.2	2.8
Sales						1.7	1.3	2.2	1.3	2.4	3.0
Balance						0.3	-1.3	-2.2	-1.1	-0.8	-0.2
Coast/Dar es Salaam											
% of Nat'l Purch.	0	0	0	5	3	6	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.7	0.9	2.0	0.0	0.0	0.0	0.0	0.0
Sales		22.6	9.8	24.4	36.8	30.9	37.6	43.1	52.4	49.6	55.8
Balance		-22.6	-9.8	-23.7	-35.9	-30.9	-37.6	-43.1	-52.4	-49.6	-55.8
Tanga											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						4.3	2.7	8.0	3.8	1.6	2.5
Balance						-4.3	-2.7	-8.0	-3.8	-1.6	-2.5
Shinyanga											
% of Nat'l Purch.	26	16	5	1	10	18	28	8	1	3	7
Purchase	9.9	2.3	0.6	0.1	3.6	6.0	8.0	1.0	0.1	0.6	1.6
Sales						1.2	2.3	0.9	1.0	1.1	1.2
Balance						4.8	5.7	-0.1	-0.9	-0.5	-0.4
Kagera											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						3.9	0.7	0.6	0.7	0.7	0.6
Balance						-3.9	-0.7	-0.6	-0.7	-0.7	-0.6
Mwanza											
% of Nat'l Purch.	7	7	6	6	3	9	14	0	0	1	1
Purchase	2.6	1.0	0.7	0.9	1.0	3.0	4.0	0.0	0.0	0.2	0.3
Sales						3.1	1.4	1.3	0.8	1.3	0.8
Balance						-0.1	-2.6	-1.3	-0.8	-1.1	-0.5
Mara											
% of Nat'l Purch.	1	1	0	0	0	0	0	0	1	0	0
Purchase	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Sales						1.7	0.8	1.0	1.2	0.6	0.6
Balance						-1.7	-0.8	-1.0	-1.1	-0.5	-0.6
Kigoma											
% of Nat'l Purch.	1	2	3	4	2	0	0	0	1	0	1
Purchase	0.5	0.3	0.3	0.6	0.7	0.0	0.0	0.0	0.2	0.1	0.2
Sales						0.7	0.4	0.6	0.5	0.6	1.0
Balance						-0.7	-0.4	-0.6	-0.3	-0.5	-0.8
Tabora											
% of Nat'l Purch.	38	16	3	3	13	12	17	0	1	6	1
Purchase	14.8	2.3	0.3	0.5	3.9	4.0	5.0	0.0	0.1	1.2	0.2
Sales						2.5	1.5	1.4	0.9	1.0	0.6
Balance						1.5	3.5	-1.4	-0.8	0.2	-0.4
Rukwa											
% of Nat'l Purch.	0	0	0	5	1	0	0	0	1	0	0
Purchase	0.0	0.0	0.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Sales						0.8	0.8	0.6	0.7	0.5	0.5
Balance						-0.8	-0.8	-0.6	-0.7	-0.5	-0.4

Sources: Compiled from

1) Tanzania, MDB, Price Policy Recommendations, Vol. I: Maize, Rice and Wheat, (DSM, 1981:Appendices 3.1-3.2; 1983:47 and 1984:52-54)
2) Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II, DSM, (1977) Table A1.37

[1] Note 1 ton paddy = 0.65 ton rice.

TABLE 6.10: NMC WHEAT PURCHASES AND SALES, 1973/74-1983/84 ('000 Tons, Wheat Equivalent[1])

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
National											
Purchases	27.9	14.4	24.5	27.1	35.3	28.9	27.2	26.9	24.1	30.9	28.3
Sales	66.4	62.8	60.3	68.7	88.0	96.3	54.8	42.4	53.1	54.8	34.3
Balance	-38.5	-48.4	-35.8	-41.6	-52.7	-67.4	-27.6	-15.5	-29.0	-23.9	-6.0
Arusha											
% of Nat'l Purch.	74	33	76	64	66	78	79	83	85	91	94
Purchase	20.6	4.7	18.5	17.3	23.2	22.5	21.6	22.3	20.4	28.1	26.5
Sales						8.3	6.8	1.3	11.0	16.7	10.4
Balance						14.2	14.8	21.0	9.4	11.4	16.1
Kilimanjaro											
% of Nat'l Purch.	13	37	5	24	17	11	10	9	5	4	2
Purchase	3.7	5.3	1.3	6.5	5.9	3.3	2.7	2.3	1.1	1.2	0.5
Sales						1.7	0.3	0.5	0.4	1.6	1.3
Balance						1.6	2.4	1.8	0.7	-0.4	-0.8
Mbeya											
% of Nat'l Purch.	1	2	2	1	0	1	0	0	0	0	0
Purchase	0.3	0.3	0.5	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Sales						1.5	0.5	0.3	0.5	0.3	0.3
Balance						-1.3	-0.5	-0.3	-0.5	-0.3	-0.3
Iringa											
% of Nat'l Purch.	9	21	14	6	14	8	7	7	6	5	4
Purchase	2.4	3.0	3.4	1.7	5.1	2.3	2.0	2.0	1.5	1.5	1.0
Sales						2.0	0.7	0.8	0.5	0.5	0.3
Balance						0.3	1.3	1.2	1.0	1.0	-0.7
Dodoma											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.9	0.5	0.7	0.8	0.8	0.9
Balance						-1.9	-0.5	-0.7	-0.8	-0.8	-0.9
Singida											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Sales						0.8	0.3	0.3	0.4	0.4	0.7
Balance						-0.8	-0.3	-0.3	-0.3	-0.4	-0.7
Ruvuma											
% of Nat'l Purch.	0	0	1	1	1	0	0	0	0	0	0
Purchase	0.0	0.0	0.3	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Sales						0.9	0.4	0.1	0.3	0.4	0.1
Balance						-0.9	-0.4	-0.1	-0.3	-0.4	-0.1
Lindi											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						0.8	0.1	0.1	0.4	0.1	0.1
Balance						-0.8	-0.1	-0.1	-0.4	-0.1	-0.1
Mtwara											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	1	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Sales						0.7	0.1	0.1	0.3	1.0	0.0
Balance						-0.7	-0.1	-0.1	-0.3	-1.0	0.0

TABLE 6.10: CONTINUED

Region	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Morogoro											
% of Nat'l Purch.	1	0	0	0	0	0	0	0	0	0	0
Purchase	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						3.5	1.5	0.7	0.7	1.2	0.8
Balance						-3.5	-1.5	-0.7	-0.7	-1.2	-0.8
Coast/Dar es Salaam											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales		31.5	22.5	31.6	47.8	60.3	39.7	32.9	39.1	28.4	15.9
Balance						-60.3	-39.7	-32.9	-39.1	-28.4	-15.9
Tanga											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						2.9	0.5	2.3	1.0	1.5	1.2
Balance						-2.9	-0.5	-2.3	-1.0	-1.5	-1.2
Shinyanga											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.2	0.3	0.3	0.4	0.4	0.3
Balance						-1.2	-0.3	-0.3	-0.4	-0.4	-0.3
Kagera											
% of Nat'l Purch.	0	0	1	2	1	1	3	0	0	0	0
Purchase	0.0	0.0	0.2	0.5	0.4	0.2	0.7	0.0	0.0	0.0	0.0
Sales						0.9	0.3	0.4	0.3	0.3	0.1
Balance						-0.7	-0.4	-0.4	-0.3	-0.3	-0.1
Mwanza											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						2.5	0.5	0.4	0.5	0.4	1.0
Balance						-2.5	-0.5	-0.4	-0.5	-0.4	-1.0
Mara											
% of Nat'l Purch.	1	0	0	0	0	0	0	0	0		0
Purchase	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						1.1	0.1	0.1	0.7	0.7	0.2
Balance						-1.1	-0.1	-0.1	-0.7	-0.7	-0.2
Kigoma											
% of Nat'l Purch.	0	0	0	0	0	0	0	0	0	0	0
Purchase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						0.4	0.3	0.4	0.3	0.4	0.3
Balance						-0.4	-0.3	-0.4	-0.3	-0.4	-0.3
Tabora											
% of Nat'l Purch.	3	0	0	0	0	0	0	0	0	0	0
Purchase	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sales						0.9	0.5	0.4	0.4	0.3	0.2
Balance						-0.9	-0.5	-0.4	-0.4	-0.3	-0.2
Rukwa											
% of Nat'l Purch.	0	6	0	0	1	1	1	1	0	0	0
Purchase	0.0	0.8	0.3	0.5	0.2	0.4	0.2	0.3	0.1	0.1	0.1
Sales						0.4	0.4	0.3	0.4	0.3	0.2
Balance						0.0	-0.2	0.0	-0.3	-0.2	-0.1

Sources: Compiled from

1) Tanzania, MDB, 'Price Policy Recommendations', Vol. I: Maize, Rice and Wheat, (DSM, 1981:34 and Appendix 4.1; 1983:48 and 1984:52,55)
2) Coopers and Lybrand Assoc. Ltd., Grain Storage and Milling Project, Vol. II, DSM, (1977) Table A1.38

[1] Note 1 ton wheat = 0.75 ton wheat flour.

TABLE 6.11 GEOGRAPHICAL DISTRIBUTION AND SEASONALITY OF NMC SEMBE SALES, 1974/75-1983/84

	Sales Tonnage:			% of Sales:		Sales' Seasonality:[1]	
Year	Nat'l Total	DSM	Non-DSM	DSM	Non-DSM	DSM	Non-DSM
1974/75	191.4	61.3	130.1	30	70	8	30
1975/76	127.3	55.9	71.4	44	56	18	37
1976/77	121.5	48.9	72.6	40	60	21	37
1977/78	96.0	49.8	46.2	52	48	21	38
1978/79	135.1	76.9	58.2	57	43	15	42
1979/80	177.8	94.0	83.8	53	47	8	31
1980/81	228.8	108.3	120.5	47	53	18	33
1981/82	211.1	121.7	89.3	58	42	14	21
1982/83	170.3	114.4	55.9	67	33	n.a.	n.a.
1983/84	176.9	123.4	53.5	70	30	4	21

[1] 'Seasonality' defined as the average % by which the monthly sales values between December-May (pre-harvest months) exceed the year's monthly mean.

Sources: Compiled from

1974/75-1979/80 Tanzania, Ministry of Agriculture, 'The Availability of Food in Tanzania in 1981/82', EWCMP, FAO/KILIMO, DSM, (July 1981), Annex 11

1980/81 Tanzania, MDB, 'Price Policy Recommendations for the 1982-83 Agricultural Price Review', Annex 1, (July 1981), Appendix 2.3

1981/82 Tanzania, MDB, 'Price Policy Recommendations for the July 1982 Agricultural Price Review', Annex 1, (July 1982), Appendix 4

1982/83 Tanzania, MDB, 'Price Policy Recommendations for the July 1983 Agricultural Price Review', Annex 1, (July 1983), 25

1983/84 Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review', Vol. I, (1984), 53

TABLE 6.12: OFFICIAL PRODUCER PRICES FOR GRAIN, 1973/74-1985/86 (TShs./Kg.)

Year	Maize	Paddy	Wheat	Sorghum/ Millet	Cassava Grade 1	Cassava Grade 2
1973/74	0.33	0.57	0.57	0.50	0.31	0.29
1974/75	0.50	0.65	0.77	0.55	0.36	0.34
1975/76	0.80	1.00	1.00	0.75	0.40	0.38
1976/77	0.80	1.00	1.20	0.90	0.50	0.40
1977/78	0.80	1.20	1.25	1.00	0.60	0.50
1978/79	0.85	1.20	1.25	1.00	0.65	0.50
1979/80	1.00	1.50	1.35	1.00	0.65	0.50
1980/81	1.00	1.75	1.65	1.00	0.65	0.50
1981/82	1.50	2.30	2.20	1.00	0.70	0.50
1982/83	1.75	3.00	2.50	1.60	0.90	0.70
1983/84	2.20	4.00	3.00	2.00	1.20	0.90
1984/85	4.00	6.00	4.50	3.00	2.00	0.90
1985/86	5.25	8.00	6.00	4.00	3.00	0.90

Source:

Tanzania, 'Price Policy Review for the 1984 Agricultural Price Review: Summary', Appendix IV

TABLE 6.13: OFFICIAL CONSUMER PRICES FOR GRAIN, 1973-1984 (TShs./Kg.)

Year	Seabe	Rice	Wheat Flour
1973	0.80	1.65	1.65
1974	1.25	2.00	2.40
1975	1.25	4.00	3.75
1976	1.75	4.00	3.75
1977	1.75	3.50	3.75
1978	1.75	3.50	3.75
1979	1.75	3.50	3.75
1980	1.25	5.35	5.65
1981	2.50	5.35	5.65
1982	2.50	5.35	5.65
1983	2.50	7.20	8.00
1984	8.00	13.40	14.50

Source:
Tanzania, 'Price Policy Review for the 1984 Agricultural Price Review: Summary', DSM, (1984), Appendix IV

TABLE 6.14: PURCHASING POWER OF MINIMUM URBAN WAGE IN TERMS OF STAPLE FOODS, 1973-1984

	Purchasing Power of Minimum Urban Wage (Kg Staple/Day's Wage):		
Year	Sembe	Rice	Wheat Flour
1973	10.0	4.8	4.8
1974	9.1	5.7	4.7
1975	10.1	3.2	3.4
1976	7.2	3.2	3.4
1977	7.2	3.6	3.4
1978	7.2	3.6	3.4
1979	7.2	3.6	3.4
1980	12.8	3.0	2.8
1981	8.0	3.7	3.5
1982	8.0	3.7	3.5
1983	8.0	2.8	2.5
1984	4.1	2.0	1.9

Source:
Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review', Vol. I, DSM, (1984), 29

TABLE 6.15: OFFICIAL GRAIN MARK-UPS,[1] 1973-1984

Year	Sembe	Rice	Wheat
1973	142	190	190
1974	150	208	212
1975	56	300	275
1976	119	300	213
1977	119	192	200
1978	106	192	200
1979	75	133	178
1980	25	206	242
1981	67	133	157
1982	43	78	126
1983	14	80	167
1984	100	123	222
Average			
1973-84	85	178	199
1964-72[2]	309	244	212

[1] Calculated by subtracting the producer price from the consumer price then dividing the difference by the producer price.

[2] Calculated from cooperative union producer price series for maize (Iringa Farmers C.U./Iringa), paddy (Nyanza C.U./Ukerewe), wheat (Arusha Region C.U./Mbulu) and Dar es Salaam retail prices recorded by the Bureau of Statistics (listed in Odegaard, K., 'A Study of Agricultural Producer Prices, their Interrelationships and Impact on Agricultural Marketing in Tanzania, 1962-1972', Office of the Prime Minister and Second Vice President, (April 1974), Annex Tables III.1-3 and Schedule No. 12).

Sources:
As listed in TABLES 6.10 and 6.11

TABLE 6.16: NMC SALES OF PREFERRED CEREALS PER URBAN RESIDENT, 1964/65-1983/84 (Kg./Capita)

Year	Maize	Rice	Wheat	Maize as % of Total	NMC Sales as % of Total Urban Requirements[1]
1964/65	215.8	57.1			190
1965/66	204.3	53.9	88.8	59	242
1966/67	151.3	64.1	80.9	51	206
1967/68	166.9	61.7	90.7	52	226
1968/69	169.7	57.2	97.6	52	325
1969/70	181.5	61.5	83.4	56	227
1970/71	155.4	69.4	79.6	51	212
1971/72	193.2	91.5	107.0	49	273
1972/73	168.4	96.2	58.9	52	225
1973/74	207.7	81.5	65.8	56	247
1974/75	181.9	38.5	56.4	66	193
1975/76	112.0	28.2	49.0	59	132
1976/77	92.6	38.5	50.6	51	127
1977/78	68.9	49.8	58.7	39	177
1978/79	94.3	42.4	58.2	48	136
1979/80	122.0	33.5	30.0	66	129
1980/81	146.2	38.5	21.0	71	143
1981/82	128.9	34.9	23.8	69	131
1982/83	84.7	29.2	22.3	62	95
1983/84	90.0	29.1	12.6	68	92
Average 1964/65-1972/73	178.5	68.1	76.3	53	236
1973/74-1983/84	120.8	40.4	40.8	60	146

[1] Total urban requirements are calculated on the basis of figures in TABLE 2.1.3. The assumptions are that: 1) 40.4% of the population are under 15 years of age (1978 census); 2) under-15s consume 90 kg of cereals per year; 3) adults consume 180 kg per year; and 4) the 1979-84 urban annual growth is the same as that recorded between 1967 and 1978.

Sources:
As listed in TABLES 2.1.1-3, 5.22-24 and 6.8-11.

TABLE 6.17: FOOD AID 1974/75-1983/84 ('000 Metric Tons)

	Food Aid:				Commercial and Food Aid Imports	Aid as % of Total Imports
	Maize	Rice	Wheat	Total		
1974/75	1.0	-	46.5	47.5		
1975/76	27.0	-	45.7	72.7	187.5	38.8
1976/77	7.0	-	33.6	40.6	80.5	50.4
1977/78	34.3	21.6	40.5	96.4	122.9	78.4
1978/79	-	20.2	45.5	65.7	102.5	64.1
1979/80	-	50.1	32.5	82.6	119.7	69.0
1980/81	86.5	51.0	48.7	186.2	388.5	47.9
1981/82	217.1	66.5	70.9	354.5	369.0	96.1
1982/83	106.4	29.4	2.0	137.8	164.2	83.9
1983/84	69.2	26.7	46.3	142.2	297.7	47.8

Sources:

1974/75 NMC figures quoted in Tanzania Food and Nutrition Centre, 'Data Report on the Food and Nutrition Situation in Tanzania 1972/73-1976/77', DSM, (1978), Table 21.21

1975/76-1983/84 Tanzania, MDB, 'Price Policy Recommendations for the 1984 Agricultural Price Review', Vol. I, (1984), 22-23

TABLE 6.18: ANNUAL CEREAL CONSUMPTION IN RURAL AND URBAN HOUSEHOLDS BY ORIGIN, 1976/77

	Expenditure Groups: 0-999	1000-1999	2000-3999	4000-5999	0-5999 Average	6000-7999	8000-9999	10000-24999	25000-39999	> 40000	>6000 Average	TOTAL
Rural												
% of Total Households	16.1	27.9	34.3	11.9	90.2	4.3	2.1	3.1	0.2	0.1	9.8	100.0
Persons per Household	4.3	5.4	6.0	6.2		7.0	8.4	8.4	9.5	11.9		5.8
Cereals per Household (kgs)	570	778	748	876	742	942	1229	883	872	1584	990	767
% of Cereals of Subsistence Origin	94.7	96.7	82.4	78.8	88.5	73.0	63.5	69.0	69.8	70.7	69.6	86.7
Urban												
% of Total Households	5.5	8.1	19.0	19.5	52.1	13.2	11.9	18.6	2.3	1.9	47.9	100.0
Persons per Household	4.2	4.6	4.6	4.4		5.0	5.6	5.7	6.3	7.3		5.0
Cereals per Household (kgs)	483	510	436	388	435	459	543	605	615	724	555	492
% of Cereals of Subsistence Origin	86.5	77.8	54.6	31.4	49.1	16.8	7.9	6.9	3.1	18.8	10.3	30.5

Source:
Tanzania, Bureau of Statistics, 1976/77 Household Budget Survey data

TABLE 6.19.1: CORRELATION OF MAIZE PRICES AMONG 38 PAIRS OF MARKETS, DEC.1982-DEC.1985

Markets	Arush	Buk	DSM	Dod	Gonja	Irin	Kig	Lindi	Lush	Maswa	Mbeya	Mbulu	Morog	Moshi	Mpwa	Mtwr	Mus	Mwnz
Arusha																		
Bukoba	.232																	
DSM	.197	.192																
Dodoma	.469	.165	.184															
Gonja	.353	-.031	.532	.333														
Iringa	.374	.031	.298	.307	.135													
Kigoma	.065	.181	.270	.112	-.128	.531												
Lindi	.184	.235	.300	.116	.201	.226	.306											
Lushoto	.241	.248	.347	.211	-.043	.331	.337	-.124										
Maswa	.260	.189	.440	.090	.019	.347	.412	-.101	.460									
Mbeya	.236	.145	.317	.225	.048	.351	.179	.229	.258	.166								
Mbulu	.542	.035	.036	.379	.136	.312	.191	-.049	.279	.169	.244							
Morogoro	.236	.096	.149	.243	-.344	.411	.423	.158	.301	.251	.408	.333						
Moshi	.076	-.154	.452	.112	.236	.217	.198	-.180	.349	.391	.139	.114	.077					
Mpwapwa	.271	-.023	.317	.397	.018	.547	.501	-.018	.420	.494	.381	.375	.510	.193				
Mtwara	.074	.195	.409	.199	-.026	.023	.194	.009	.344	.308	.086	.072	.161	.034	.322			
Musoma	-.099	.145	.109	.036	.010	.167	-.147	-.070	.008	.028	-.156	.231	-.106	-.134	-.075	-.080		
Mwanza	-.125	-.035	.410	-.176	-.011	.232	.115	.049	.101	.169	.411	-.011	.232	-.326	.285	-.187	.134	
Njombe	.427	.073	.396	.371	.251	.498	.432	.041	.568	.645	.193	.296	.316	.584	.531	.323	-.054	.034
Sengerema	-.075	.354	.362	.050	.136	.331	.301	.279	.124	.083	.316	-.028	.081	-.060	.158	.078	.239	.409
Shinyanga	-.044	.037	.391	-.056	.006	.416	.515	-.094	.376	.560	.363	.220	.155	.296	.405	.160	.101	.375
Singida	.519	.176	.297	.499	.186	.460	.282	.166	.423	.446	.579	.294	.451	.329	.547	.318	-.261	.155
Songea	.187	-.192	.377	.300	.180	.374	.055	.258	.158	.041	.326	.511	.255	.251	.379	.155	.104	.173
Sumbawanga	-.006	.106	.117	.121	-.105	.097	.181	-.139	.367	.135	.308	.239	.314	.296	.105	.100	-.042	.076
Tabora	.034	.277	.321	-.118	-.069	.244	.314	.000	.460	.169	.361	.102	.307	.002	-.044	.076	.118	.165
Tanga	-.011	.106	.341	.158	-.026	-.104	-.067	-.014	.181	-.165	-.085	.310	.079	.252	.052	.006	-.123	-.110
Tarime	.074	.159	.311	.075	.081	.255	.172	-.061	.297	.126	.231	.326	.185	.004	.313	.195	-.015	.294
Tunduru	.083	.379	.369	.408	.040	.166	.164	.131	.440	.247	.490	.165	.162	.194	.272	.341	.109	.329
Urambo	.167	.381	.156	.179	-.020	.412	.523	.206	.315	.333	.522	.185	.481	.031	.390	.202	.004	.347

Markets	Njmb	Seng	Shin	Sing	Song	Sumb	Tab	Tang	Tarm	Tund
Sengerema	-.023									
Shinyanga	.442	.379								
Singida	.538	.089	.180							
Songea	.372	-.005	.182	.344						
Sumbawanga	.407	.056	.254	.221	.102					
Tabora	.197	.296	.388	.102	-.179	.371				
Tanga	.189	-.234	-.297	.149	.252	-.028	-.132			
Tarime	.119	.025	.222	.279	.282	-.022	.204	.059		
Tunduru	.354	.264	.331	.337	.262	.386	.206	-.063	.200	
Urambo	.244	.539	.460	.553	.053	.510	.474	-.186	.238	.290

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-December 1985

TABLE 6.19.2: CORRELATION OF RICE PRICES AMONG 26 PAIRS OF MARKETS, DEC.1982-DEC.1985

Markets	Arush	Buk	DSM	Dod	Irin	Kig	Lindi	Lush	Mbeya	Mbulu	Morog	Moshi	Mpwa	Mtwr	Mus	Mwnz	Njmb	Shin
Arusha																		
Bukoba	.290																	
DSM	.375	.378																
Dodoma	.242	.248	.322															
Iringa	.207	.340	.392	.155														
Kigoma	-.115	.596	.292	.312	.267													
Lindi	.048	.158	.223	.218	.177	.242												
Lushoto	.093	.455	.445	.145	.558	.289	.216											
Mbeya	.225	.446	.123	.325	.405	.366	.262	.126										
Mbulu	.231	.711	.380	.572	.243	.666	.226	.230	.513									
Morogoro	.310	.338	.194	.069	.157	-.046	.173	.188	.205	.334								
Moshi	-.037	.235	.277	.074	.352	.442	.253	.401	-.007	.202	-.159							
Mpwapwa	.274	.330	.443	.501	.337	.332	.486	.427	.037	.450	.363	.409						
Mtwara	.349	.276	.364	.169	.022	-.096	.254	.182	.001	.159	.485	-.038	.282					
Musoma	.439	.579	.684	.618	.408	.304	.545	.378	.243	.483	.193	.482	.556	.345				
Mwanza	.109	.364	.441	.210	.669	.504	.572	.456	.281	.337	.016	.584	.394	.039	.597			
Njombe	.300	.234	.286	.074	.353	.198	.218	.350	.212	.121	.192	.104	.180	.072	.432	.107		
Shinyanga	.317	.266	.233	.372	.425	.204	.280	.402	.400	.166	.077	.315	.364	.123	.384	.461	.212	
Singida	.431	.265	.099	.147	.432	-.021	.233	.491	.005	.064	.376	.046	.312	.244	.297	.442	.410	.454
Songea	.123	.367	.065	.067	.078	.153	.376	.182	.244	.366	.313	-.045	.150	.338	.455	.214	.238	-.029
Tabora	.259	.696	.398	.365	.361	.682	.231	.417	.504	.664	.052	.381	.279	.032	.590	.533	.281	.431
Tanga	.150	.396	.403	.558	.187	.236	.601	.238	.115	.351	.252	.385	.533	.142	.840	.491	.169	.264
Urambo	-.005	.320	.220	.299	.521	.379	.220	.518	.380	.246	.148	.524	.321	.148	.368	.653	.188	.745

Markets	Sing	Song	Tab	Tang
Songea	.289			
Tabora	.287	.284		
Tanga	.319	.378	.310	
Urambo	.339	.045	.450	.212

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-December 1985

TABLE 6.19.3: SUMMARY RESULTS OF GRAIN PRICE CORRELATIONS AMONG PAIRS OF MARKETS, DEC.1982-DEC.1985

Correlation Coefficient	Proportion of Total Coefficients by Commodity: Maize	Rice
0.85+		.000
0.80-0.84		.004
0.75-0.79		.000
0.70-0.74		.008
0.65-0.69	.000	.028
0.60-0.64	.002	.008
0.55-0.59	.012	.040
0.50-0.54	.039	.040
0.45-0.49	.034	.055
0.40-0.44	.049	.083
0.35-0.39	.076	.123
0.30-0.34	.108	.099
0.25-0.29	.081	.103
0.20-0.24	.081	.138
0.15-0.19	.135	.087
0.10-0.14	.084	.055
0.05-0.09	.069	.047
0.00-0.04	.069	.040
-0.04-0.00	.057	.032
-0.09-0.05	.032	.004
-0.14-0.10	.032	.004
-0.19-0.15	.025	.004
-0.24-0.20	.002	.000
-0.29-0.25	.005	
-0.34-0.30	.005	
-0.39-0.35	.000	
Total	.997	1.002
No. of Markets	29	23
No. of Pairs	406	253
First Quartile	0.30-0.34	0.40-0.44
Second Quartile	0.15-0.19	0.25-0.29
Third Quartile	0.00-0.04	0.10-0.15

Source:

Parallel Market Prices quoted in the Monthly Market Bulletin, March 1983-December 1985, MDB, Ministry of Agriculture

Data Handling Procedure

Using monthly parallel market price data collected by on-site Ministry of Agriculture personnel for the markets listed below, price changes were calculated by subtracting each monthly observation from the one preceding it to obtain first differences. Months when the commodity was not available were calculated with a dummy price of TShs. 1000 to indicate the scarcity value. Each market was represented by a data set of 36 monthly first difference values. Spearman's Rank Correlation Coefficients for each pair of markets were then calculated.

TABLE 6.20: TOTAL ANNUAL FOOD CONSUMPTION IN RURAL AND URBAN HOUSEHOLDS, 1976/77

Expenditure Group (TSh)	0-999	1000-1999	2000-3999	4000-5999	6000-7999	8000-9999	10000-24999	25000-39999	40000-	TOTAL
No. of Household Members	4.2	4.6	4.6	4.4	5.0	5.6	5.7	6.3	7.3	5.0
Value of Total Consumption per Capita (TShs)	460	609	835	1,205	1,437	1,610	2,578	4,754	6,667	1,693
% Composition of Total Value:										
FOOD AND DRINK	95.6	82.0	71.3	59.6	60.0	57.6	46.8	32.4	23.9	51.2
CEREALS	(46.0)	(32.7)	(21.7)	(16.7)	(15.3)	(14.6)	(10.2)	(5.8)	(4.2)	(13.2)
Paddy	0.1	0.1	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1
Rice, Husked	4.8	5.8	5.2	6.1	6.9	7.1	5.5	3.4	2.0	5.4
Maize, Grain	1.5	2.7	3.8	2.1	0.8	0.8	0.4	0.2	0.1	1.0
Maize, Flour	17.2	12.2	9.5	7.6	6.6	6.0	3.8	1.4	0.8	5.2
Millet, Grain	1.6	1.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1
Millet, Flour	1.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Sorghum, Grain	0.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sorghum, Flour	17.8	7.4	1.8	0.1	0.1	0.0	0.0	0.0	0.0	0.6
Wheat, Grain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wheat, Flour	0.0	0.0	0.2	0.3	0.7	0.4	0.4	0.6	0.7	0.4
Other Cereals	0.8	1.4	0.1	0.1	0.1	0.0	0.0	0.1	0.6	0.2
Cost of Grinding	0.6	0.3	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.1
CEREAL PRODUCTS	(1.6)	(1.7)	(2.6)	(3.5)	(4.5)	(4.7)	(3.8)	(2.1)	(1.2)	(3.3)
Bread	1.1	0.9	1.6	2.5	3.2	3.5	2.8	1.6	0.9	2.4
STARCHY ROOTS & PLANTAINS	(9.5)	(10.9)	(9.7)	(4.8)	(3.2)	(3.4)	(2.5)	(1.4)	(1.2)	(3.7)

Source:
Tanzania, Central Statistical Bureau, 1976/77 Household Budget Survey data

TABLE 6.21.1: MAIZE PARALLEL MARKET PRICES BY TOWN, 1982/83-1985/86 (TShs./Debe)[1]

	1982/83 (Nov-June):			1983/84 (July-June):			1984/85 (July-June):			1985/86 (July-June):		
	Mean	C.V.	Months Maize not Available	Mean	C.V.	Months Maize not Available	Mean	C.V.	Months Maize not Available	Mean	C.V.	Months Maize not Available
Arusha	66.00	.069	0	216.36	.670	0	278.13	.161	0	181.67	.235	0
Bukoba	108.75	.178	0	159.63	.247	0	308.75	.365	6	242.43	.164	0
DSM	116.67	.247	5	-	-	12	104.76	.084	3	233.81	.175	4
Dodoma	104.00	.053	2	198.00	.579	0	209.63	.154	0	184.17	.257	0
Gonja	111.67	.212	0	208.64	.345	0	223.33	.282	0	189.00	.166	0
Iringa	74.69	.012	0	146.88	.514	0	157.71	.065	0	170.31	.284	0
Kigoma	103.13	.165	0	137.27	.323	0	195.00	.308	0	208.13	.330	0
Lindi	81.00	.025	1	113.12	.244	5	153.90	.173	0	170.96	.336	0
Lushoto	96.25	.099	0	198.13	.431	0	228.96	.163	0	210.54	.149	0
Maswa	75.00	.141	0	207.22	.491	1	300.00	.240	0	152.50	.273	0
Mbeya	75.00	.077	0	203.33	.403	0	117.25	.161	0	145.56	.210	0
Mbulu	85.83	.119	0	126.67	.526	0	126.04	.263	0	95.21	.073	0
Morogoro	159.29	.729	1	208.00	.628	0	183.13	.154	0	200.98	.286	0
Moshi	66.75	.134	0	198.88	.608	0	228.54	.250	0	181.46	.165	0
Mpwapwa	93.57	.168	1	158.41	.741	0	149.38	.215	0	165.00	.312	0
Mtwara	85.00	.059	0	125.10	.112	2	193.13	.167	1	247.50	.161	1
Musoma	115.00	.061	1	178.33	.249	2	319.38	.313	0	200.63	.122	0
Mwanza	112.50	.061	0	200.91	.428	1	285.42	.311	0	196.82	.207	0
Njombe	45.00	.000	0	86.79	.616	0	111.25	.164	0	115.42	.183	0
Sengerema	85.60	.399	0	135.92	.403	0	181.44	.448	0	177.13	.369	0
Shinyanga	116.88	.123	0	240.06	.413	0	267.08	.313	0	171.04	.237	0
Singida	83.29	.081	0	201.82	.485	0	194.17	.214	0	140.00	.147	0
Songea	49.64	.196	0	64.83	.456	0	77.08	.097	0	90.53	.210	0
Sumbawanga	50.63	.164	0	124.79	.596	0	115.00	.111	0	109.17	.207	0
Tabora	66.00	.109	1	141.67	.369	5	138.75	.238	0	154.38	.237	0
Tanga	87.50	.121	4	190.83	.614	4	185.34	.177	1	228.54	.228	0
Tarime	70.00	.062	0	127.50	.194	0	270.91	.326	0	239.25	.206	0
Tunduru	55.00	.257	0	90.15	.139	5	122.50	.268	2	124.29	.168	0
Urambo	55.00	.049	0	168.33	.560	0	127.50	.437	0	120.71	.417	0
MEAN	86.02	.144	.55	162.77	.442	1.3	191.50	.228	.24	174.04	.225	.17
Std. Dev.	25.89	.141		45.16	.166		68.98	.098		44.26	.78	
C.V.	.301	.979		.277	.376		.360	.431		.254	.346	

[1] 'Debe' - local volume measure of approximately 17 kg.

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-September 1986

TABLE 6.21.2: FOUR-YEAR SUMMARY OF MAIZE MARKET PRICES, JULY-JUNE 1982/83-1985/86, (TShs/Debe)[1]

Town	Annual Mean	Highest Annual C.V.	Total Months Maize not Available	Total Months without Price Data
Songea	70.52	.456	0	5
Njombe	89.62	.616	0	14
Tunduru	97.99	.326	7	11
Sumbawanga	99.90	.596	0	0
Mbulu	108.44	.526	0	2
Urambo	117.89	.560	0	5
Tabora	125.20	.369	6	7
Lindi	129.75	.336	6	7
Mbeya	135.29	.403	0	12
Iringa	137.40	.514	0	0
Mpwapwa	141.59	.741	1	1
Sengerema	145.02	.448	0	12
DSM	151.75	.247	24	4
Singida	154.82	.485	0	2
Kigoma	160.88	.330	0	7
Mtwara	162.68	.167	4	16
Moshi	164.72	.608	0	0
Tanga	173.05	.614	9	4
Tarime	176.92	.326	0	7
Gonja	183.16	.345	0	12
Lushoto	183.47	.431	0	5
Maswa	183.68	.491	1	16
Arusha	185.54	.670	0	1
Mororgoro	187.85	.729	1	6
Shinyanga	198.77	.413	0	0
Mwanza	198.91	.428	1	3
Musoma	203.34	.313	3	7
Bukoba	204.89	.365	2	17

[1] 'Debe' - local volume measure of approximately 17 kg.

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-September 1986

TABLE 6.22.1: RICE PARALLEL MARKET PRICES BY TOWN, 1982/83-1985/86 (TShs/Kg.)

	1982/83 (Nov-June):			1983/84 (July-June):			1984/85 (July-June):			1985/86 (July-June):		
Town	Mean	C.V.	Months Rice not Available	Mean	C.V.	Months Rice not Available	Mean	C.V.	Months Rice not Available	Mean	C.V.	Months Rice not Available
Arusha	23.21	.168	1	33.45	.316	2	47.31	.143	0	45.63	.215	0
Bukoba	26.25	.067	2	25.83	.100	5	52.75	.225	1	40.64	.099	0
DSM	15.27	.384	3	-	-	12	37.92	.040	3	48.33	.224	3
Dodoma	10.38	.554	4	17.75	1.211	4	36.63	.090	0	38.52	.175	0
Iringa	18.63	.203	0	27.67	.364	0	28.79	.212	0	34.98	.301	0
Kigoma	22.50	.198	1	29.63	.247	4	41.88	.136	0	37.71	.197	0
Lindi	16.50	.000	4	-	-	11	28.69	.168	0	39.07	.420	0
Lushoto	13.42	.083	2	23.86	.324	1	36.38	.176	0	35.31	.256	0
Mbeya	13.33	.194	1	27.07	.418	0	41.20	.360	1	37.50	.306	0
Mbulu	16.17	.170	0	21.04	.379	6	25.00	.141	10	48.43	.290	1
Morogoro	14.50	.093	1	28.54	.426	0	30.88	.173	0	44.29	.346	0
Moshi	17.22	.137	0	29.52	.475	0	42.47	.102	0	47.14	.251	0
Mpwapwa	16.17	.407	2	24.36	.092	4	38.64	.053	1	42.57	.179	1
Mtwara	6.09	.166	1	25.42	.097	1	28.85	.179	0	45.36	.311	0
Musoma	17.50	.000	4	-	-	8	50.00	.080	5	35.88	.202	0
Mwanza	14.10	.096	1	-	-	11	39.56	.223	4	30.20	.270	0
Njombe	16.92	.159	1	22.95	.142	1	29.51	.211	0	32.18	.104	0
Shinyanga	13.06	.103	0	26.96	.521	0	32.54	.220	0	26.73	.251	0
Singida	16.80	.200	2	26.25	.212	1	35.83	.069	0	32.79	.226	0
Songea	16.42	.071	1	20.60	.133	7	28.81	.211	0	35.91	.233	0
Tabora	12.00	.250	2	22.43	.486	0	33.57	.160	1	32.35	.216	0
Tanga	14.17	.201	3	-	-	11	37.05	.112	1	39.73	.309	0
Urambo	14.75	.101	0	28.54	.461	0	32.08	.235	0	28.46	.186	0
MEAN	15.89	.174	1.57	25.66	.356	3.87	36.36	.162	1.17	38.25	.242	1.0
Std. Dev.	4.22	.129		3.82	.259		7.26	.073		6.32	.074	
C.V.	.265	.742		.149	.729		.200	.454		.165	.305	

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-September 1986

TABLE 6.22.2: FOUR-YEAR SUMMARY OF RICE MARKET PRICES, 1982/83-1985/86, (TShs/Kg.)

Town	Annual Mean	Highest Annual C.V.	Total Months Maize not Available	Total Months without Price Data
Shinyanga	24.82	.521	0	0
Tabora	25.09	.486	3	7
Njombe	25.39	.211	2	13
Songea	25.44	.233	8	2
Dodoma	25.82	1.211	8	5
Urambo	25.96	.461	0	5
Mtwara	26.43	.311	2	14
Lushoto	27.24	.324	3	4
Iringa	27.52	.364	0	0
Mbulu	27.66	.379	17	2
Singida	27.92	.226	3	2
Mwanza	27.95	.270	16	4
Lindi	28.09	.420	15	5
Morogoro	29.55	.426	1	6
Mbeya	29.78	.418	2	9
Tanga	30.32	.309	15	3
Mpwapwa	30.44	.407	8	1
Kigoma	32.93	.247	5	6
DSM	33.84	.384	21	0
Moshi	34.09	.475	0	0
Musoma	34.46	.202	17	7
Bukoba	36.37	.225	8	16
Arusha	37.40	.316	3	0

Source: Compiled from
Tanzania, MDB, Monthly Market Bulletin, March 1983-September 1986

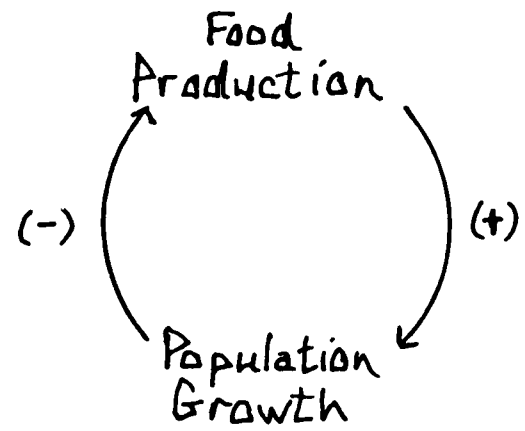
TABLE 6.23: ALLOCATION OF FOREIGN EXCHANGE BY SECTOR, 1977-1981 (TShs.'000,000,000)

	1977			1978			1979			1980			1981		
	Req'd	Granted	%	Req'd	Granted	%	Req'd	Granted	%	Req'd	Granted	%	Req'd	Granted	%
Petroleum	1,051	1,051	100	1,189	1,081	100	1,869	1,742	93	2,773	1,975	71	3,138	2,280	72
Transport	2,323	868	37	3,519	1,225	35	3,661	489	13	3,798	392	10	3,402	303	9
Machinery (new)	1,231	323	26	1,712	403	23	1,708	17	1	1,063	14	0	2,367	212	9
Spares	1,723	764	44	1,634	698	43	2,279	319	14	2,996	514	17	1,365	277	20
Industrial Raw Materials	3,140	1,368	43	4,695	2,469	52	6,541	1,558	24	9,211	1,331	14	9,977	1,948	19
Building Construction	1,012	269	27	1,281	371	28	1,206	115	9	1,303	91	7	996	70	7
Consumer Goods	3,754	1,118	29	3,620	1,422	39	3,069	589	19	3,794	541	14	3,643	571	7
Externally Financed Imports		1,764			3,393			4,668			3,817			5,447	
Total Imports	15,950	8,050	50	21,045	11,064	52	25,003	9,498	38	28,759	9,209	32	32,174	11,556	36
Externally Financed Imports as % of Total Allocation		22			30			49			41			47	

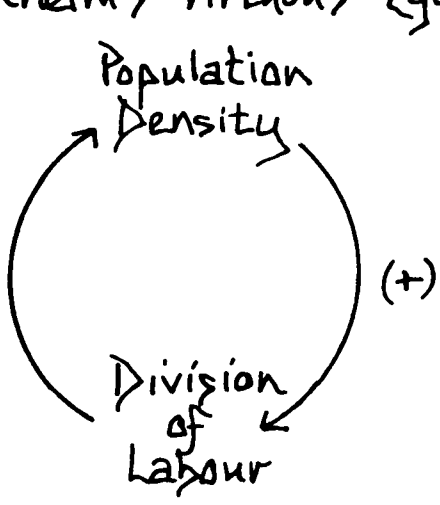
Source:
IBRD, Tanzania: Update on the State of the Economy, Washington D.C., (1982), Table 3.7

FIGURE 1.1: Inter-relationships between Food Supply, Population Change and the Division of Labour

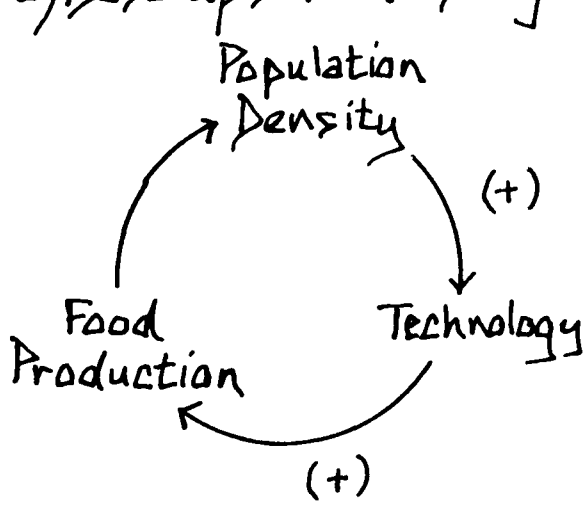
a) Malthus' Vicious Cycle



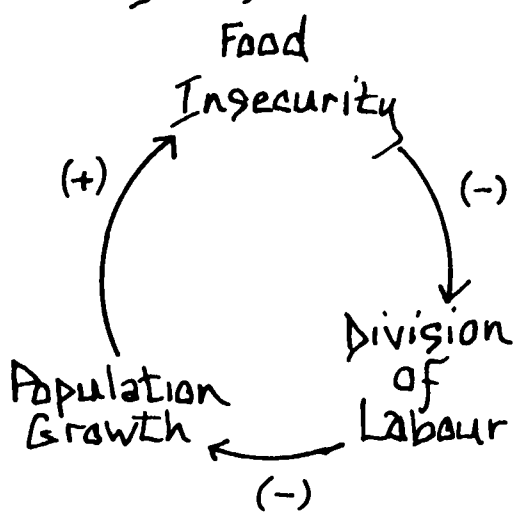
b) Durkheim's Virtuous Cycle



c) Boserup's Virtuous Cycle



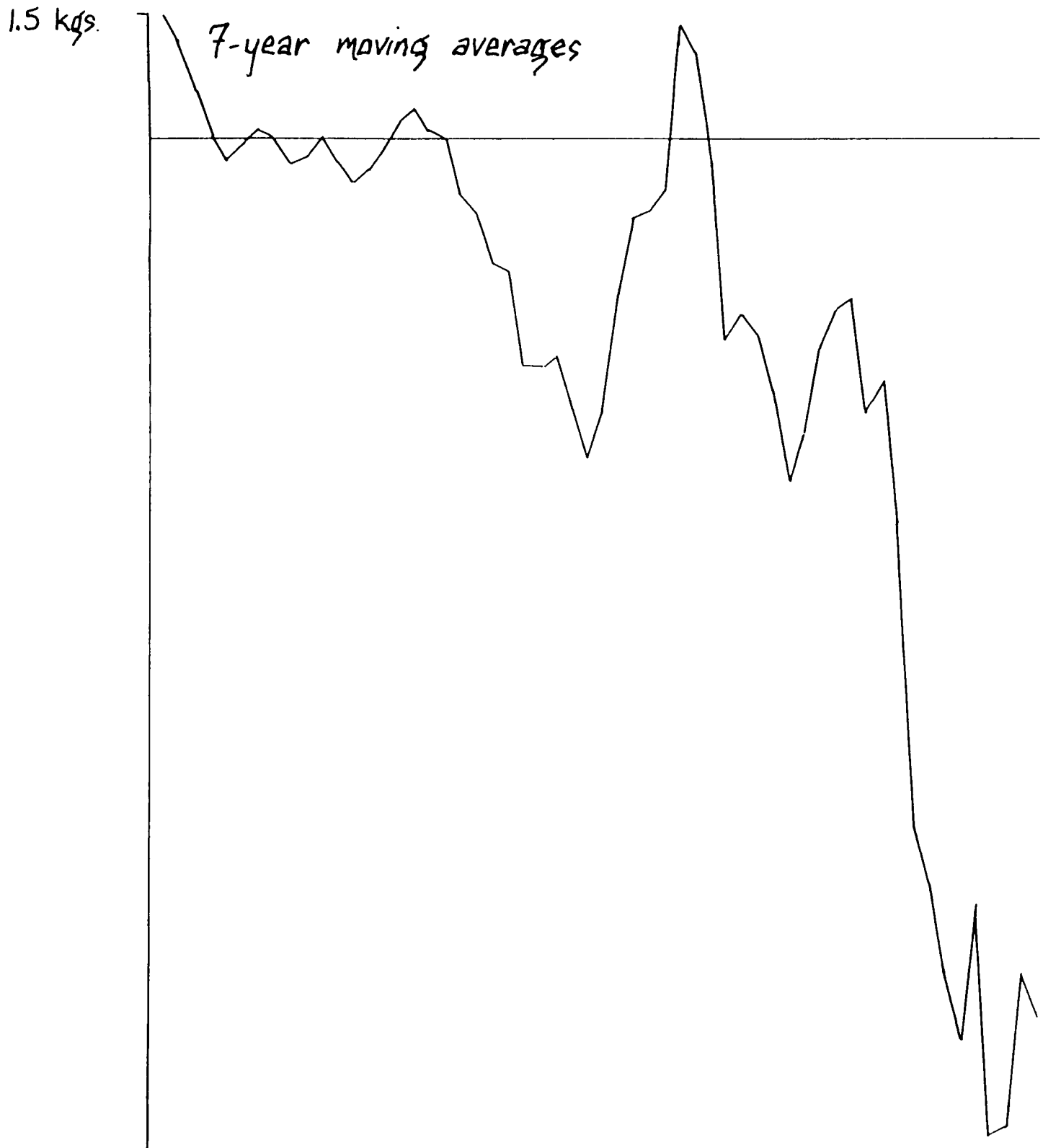
d) Vicious Cycle of Food Insecurity



(+) positive relationship

(-) negative relationship

FIGURE 2.1: Net Grain Import/Exports per Capita, 1921-1984



Source: Table 2.3

FIGURE 2.2: The Household/Market Interface

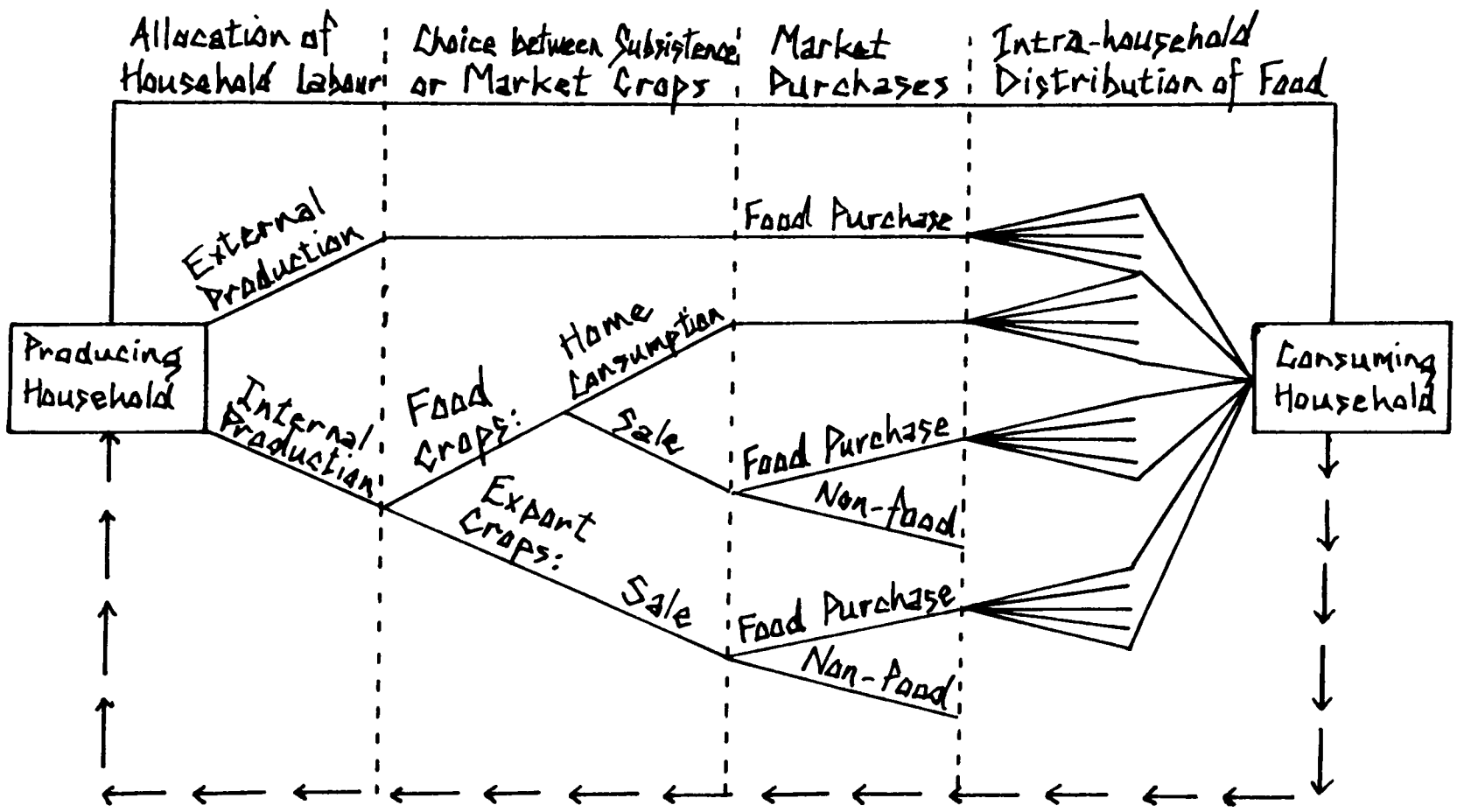


FIGURE 2.3: Peasant Household Reproductive Cycle

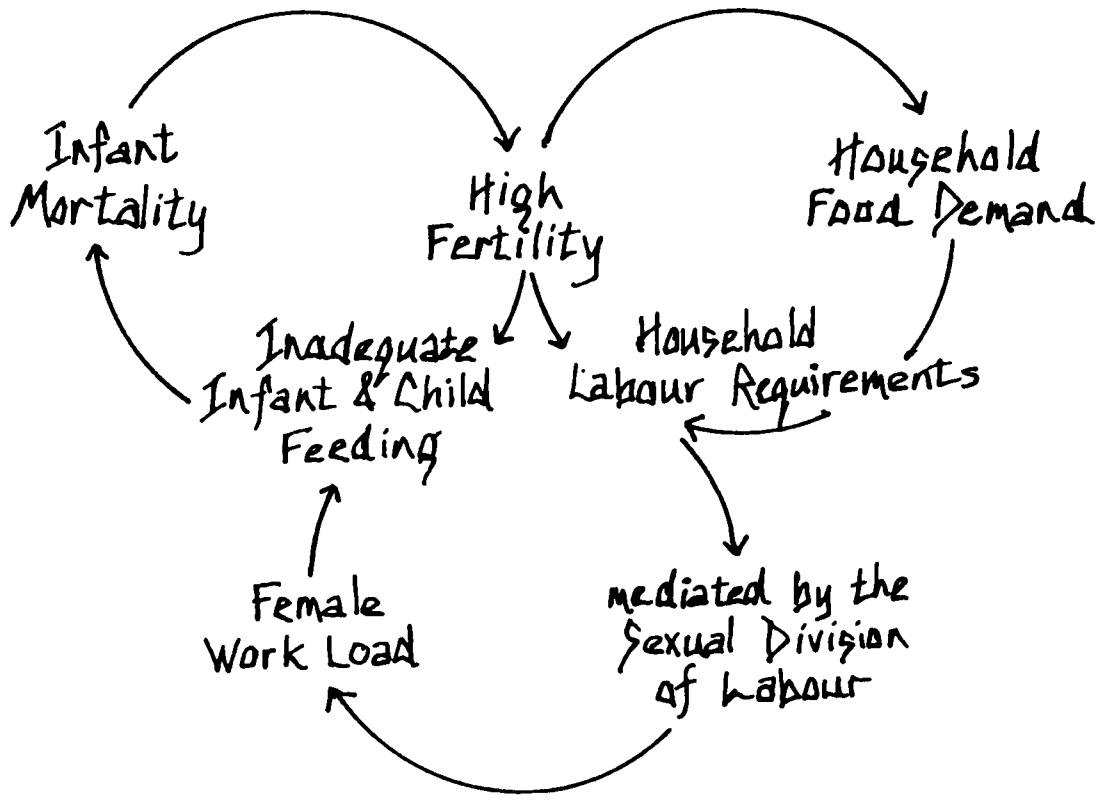


FIGURE 3.1: Theoretical Relationship between Content and Content of Social Institutions

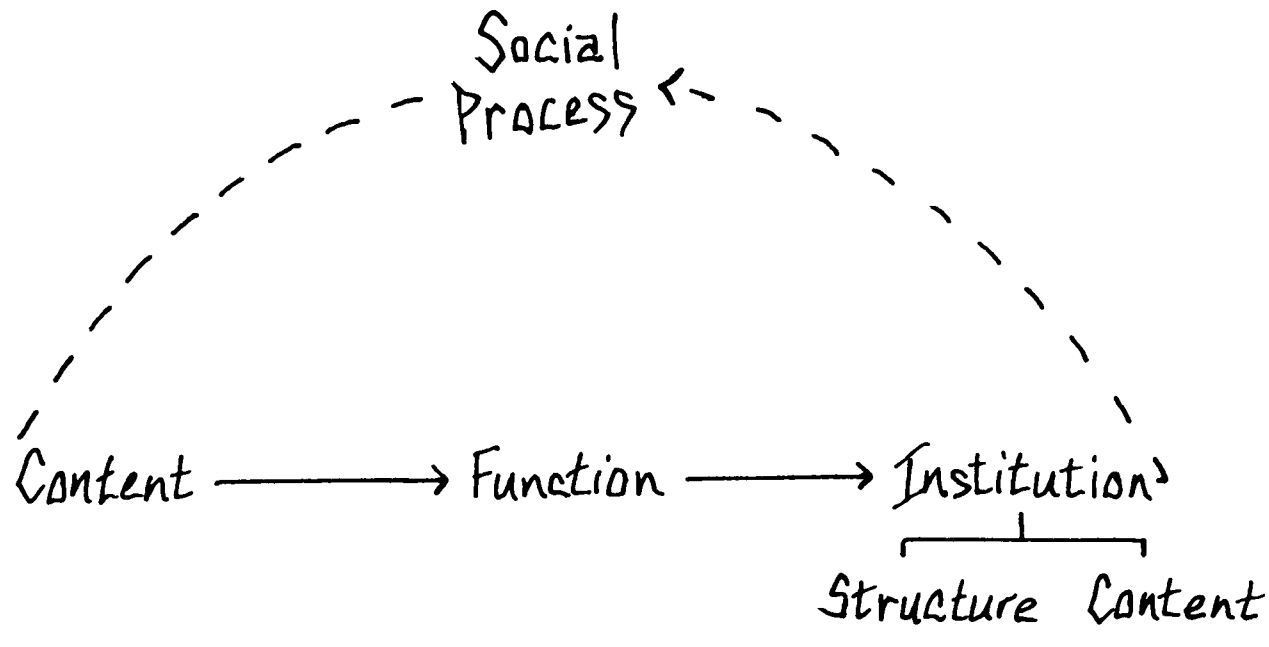


FIGURE 3.2: Institutional Interplay

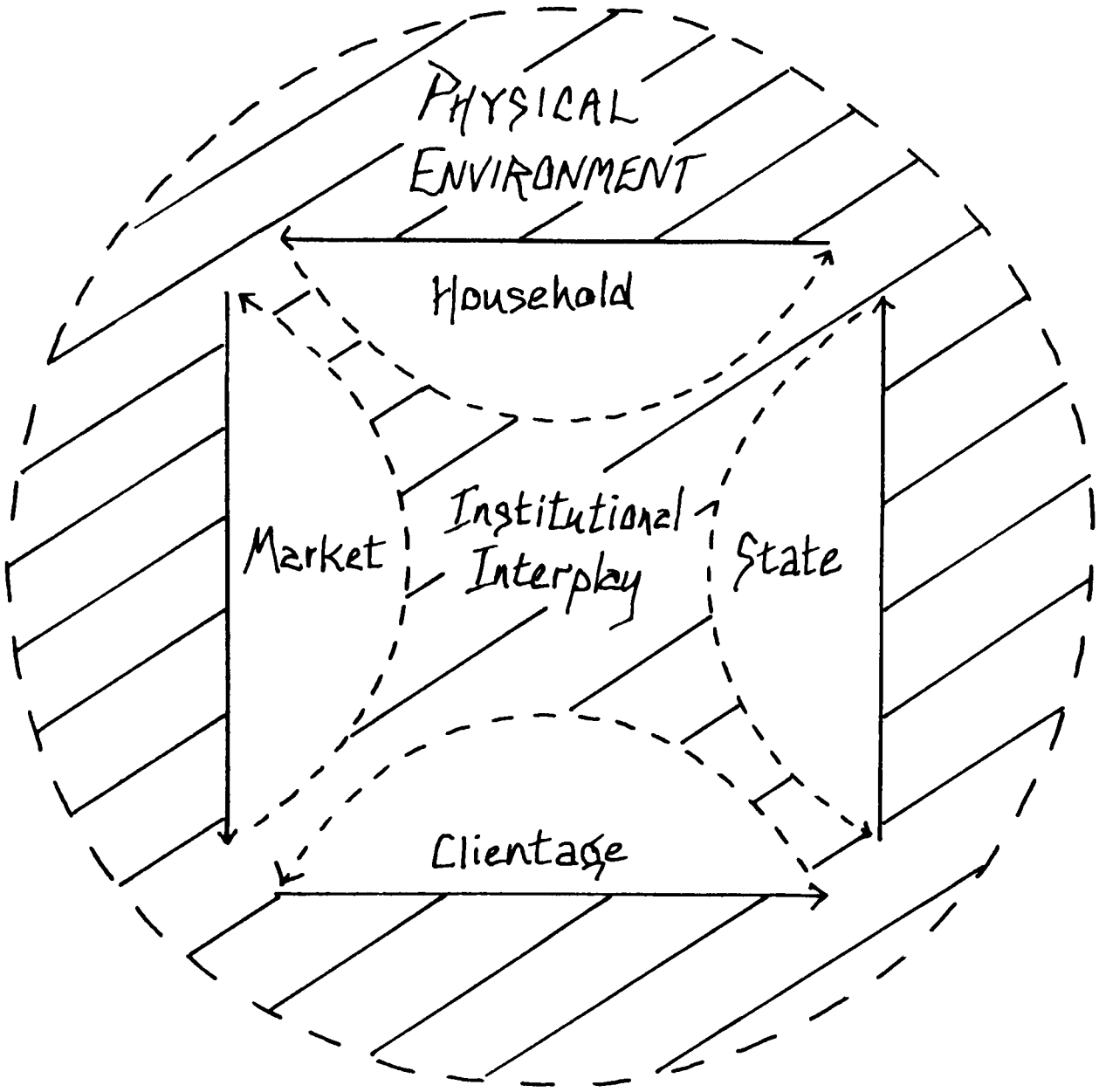
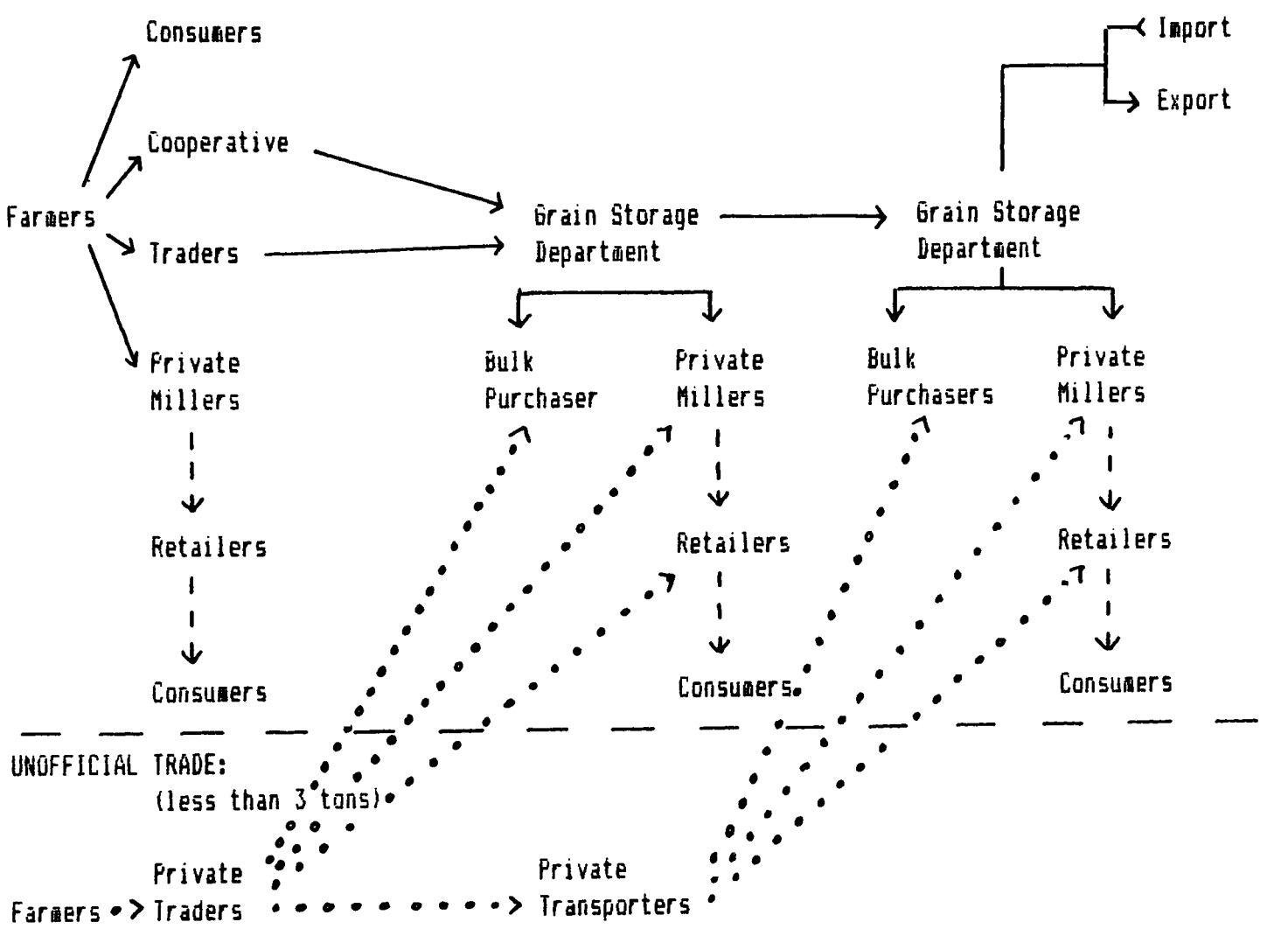


FIGURE 5.1: SIMPLIFIED MARKETING CHAIN FOR GRAIN SALE UNDER THE GRAIN STORAGE DEPARTMENT, 1949-1956



PRICE CONTROL: Into- and Ex-Store Prices Regionally Fixed by the Grain Storage Department
Ex-mill and Retail Prices set by the District Commissioner and Price Control Advisory Board

LICENSING: Millers and Traders

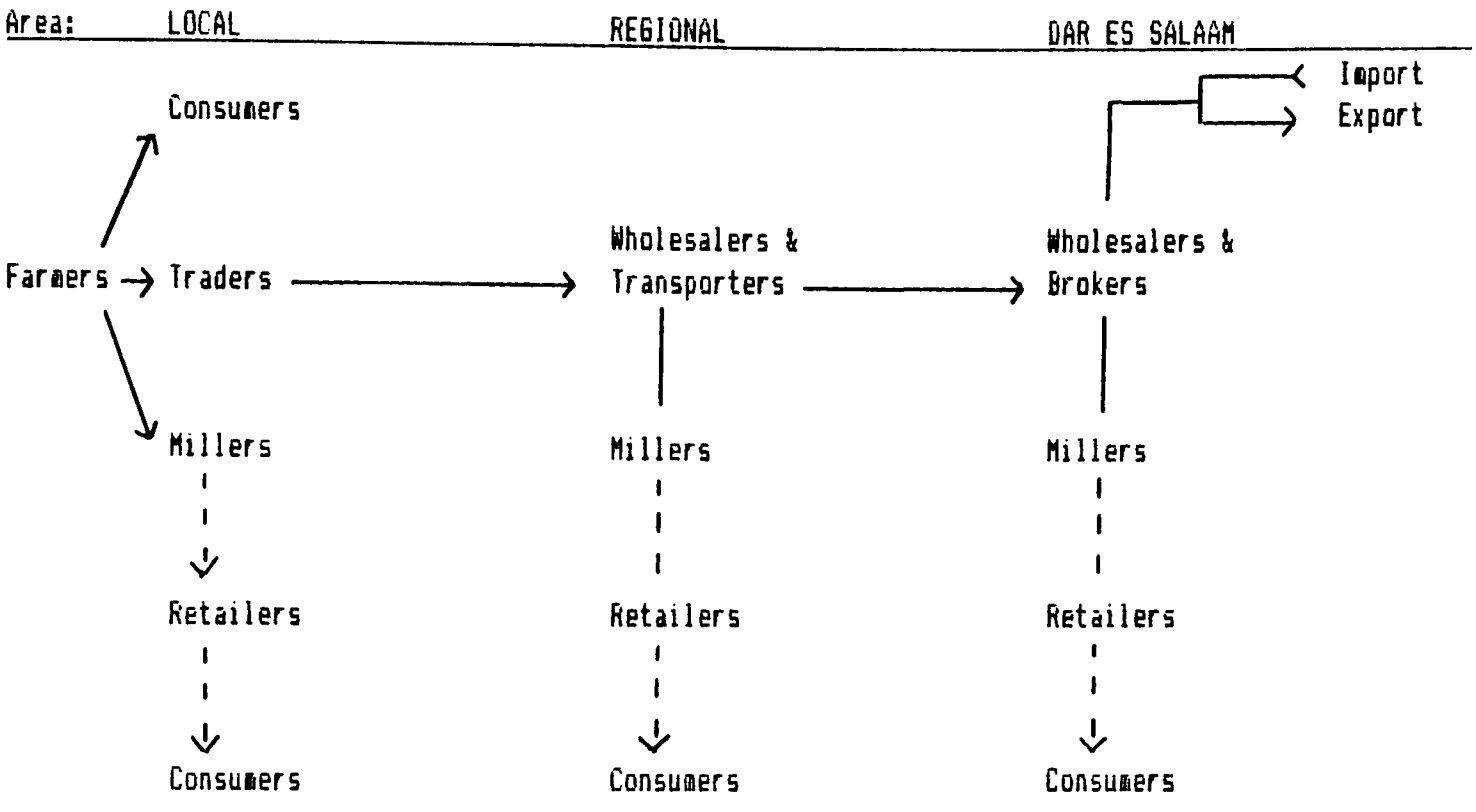
—— Raw Product

- - - Finished Product

• • • • Illicit Trade Flow

Source: Tanganyika, Grain Storage Department, Annual Report, (Dar es Salaam, 1957)

FIGURE 5.2: SIMPLIFIED MARKETING CHAIN FOR GRAIN SALE UNDER PRIVATE TRADE, 1957-1962



PRICE CONTROL: None

LICENSING: Transporters, Wheat Millers and Retailers

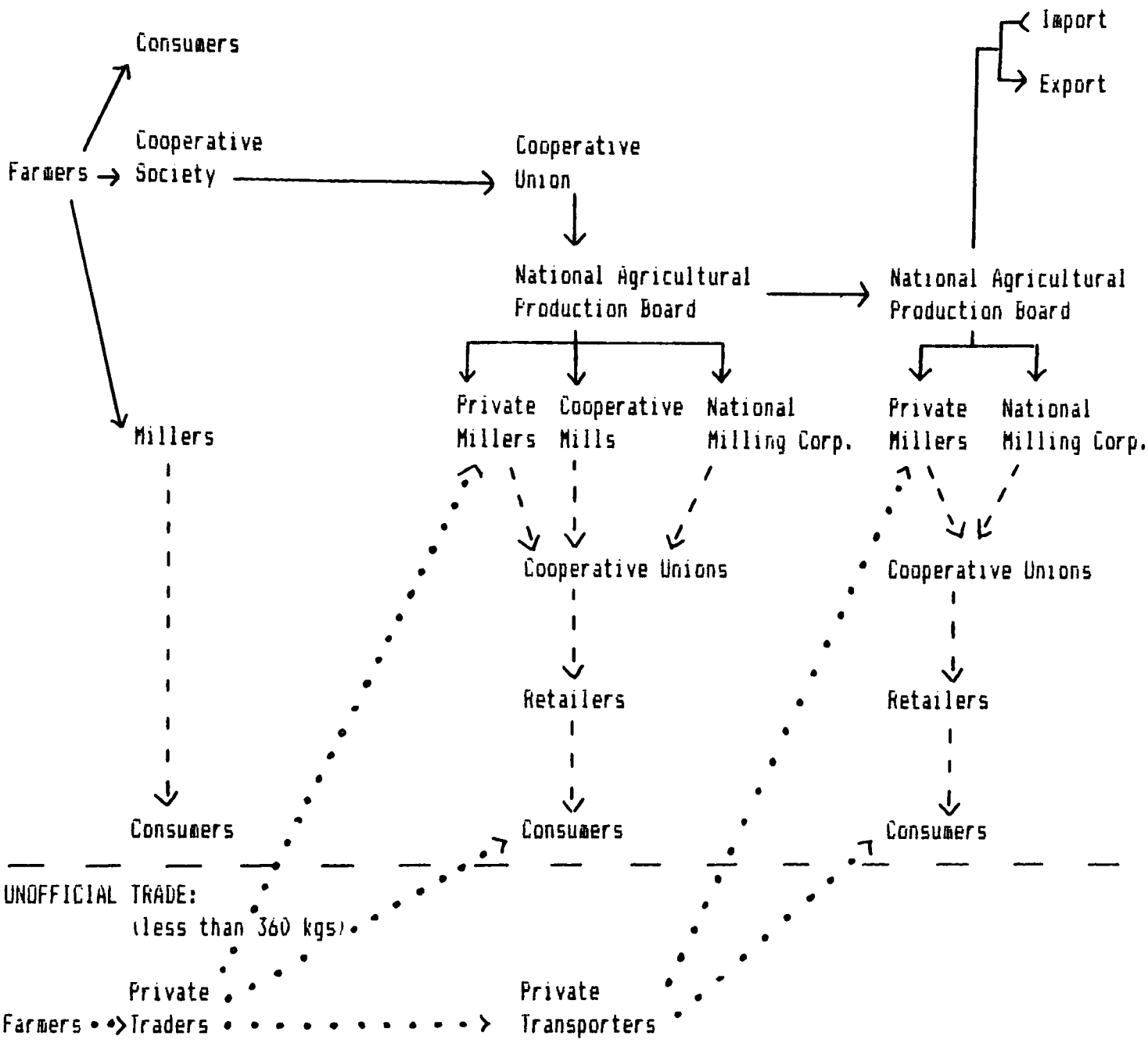
——— Raw Product

- - - Finished Product

• • • Illicit Trade Flow

Source: Kreisel, H.C. et al., Agricultural Marketing in Tanzania: Background Research and Policy Proposals, (East Lansing, Michigan State University, 1970), 22

FIGURE 5.3: SIMPLIFIED MARKETING CHAIN FOR GRAIN SALE UNDER THE NATIONAL AGRICULTURAL PRODUCTION BOARD, 1963-1972



PRICE CONTROL: NAPB Into- and Ex-Store Prices territorially fixed by the Economic Commission of the Cabinet; Retail Prices locally fixed by the Regional and Area Commissioners under the authority of the Price Controller

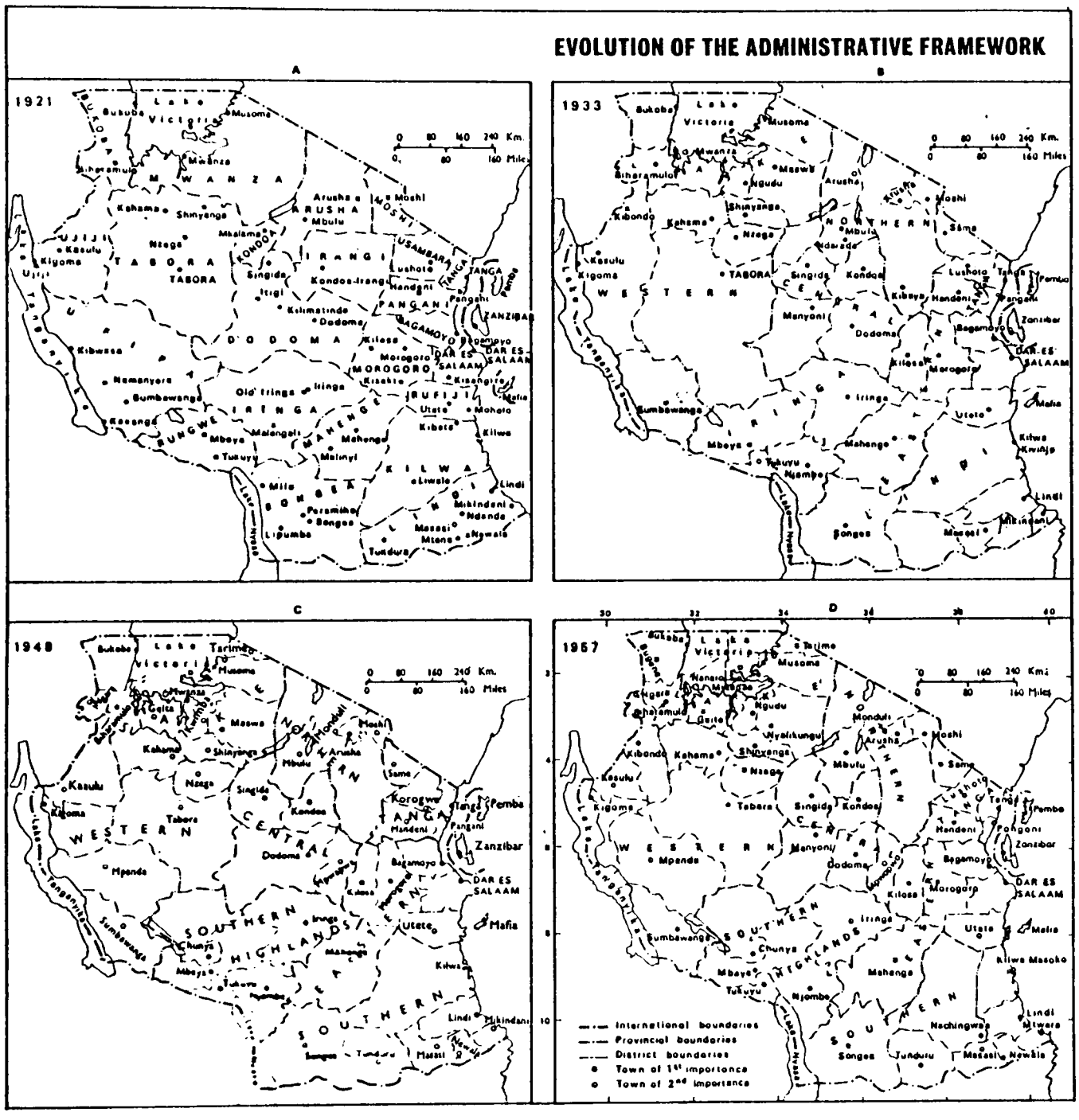
LICENSING: Transporters' licenses issued by the Transport Licensing Authority; Millers' licenses issued by the NAPB with recommendation from the Area Commissioners and Commissioner for Coopereratives; Retailers' licenses issued by Town and District Councils

—— Raw Product
- - - Finished Product
• • • Illicit Trade Flow

Sources:

1) Kreisel, H.C. et al., Agricultural Marketing in Tanzania: Background Research and Policy Proposals, (East Lansing, Michigan State University, 1970), 23
2) Tanzania, Marketing Development Bureau, 'A Strategic Grain Reserve Programme for Tanzania', Vol. II, (DSM, Noveaber 1974, R/8/74), 28-29

Map 1.1: Provinces and Districts, 1921-1961

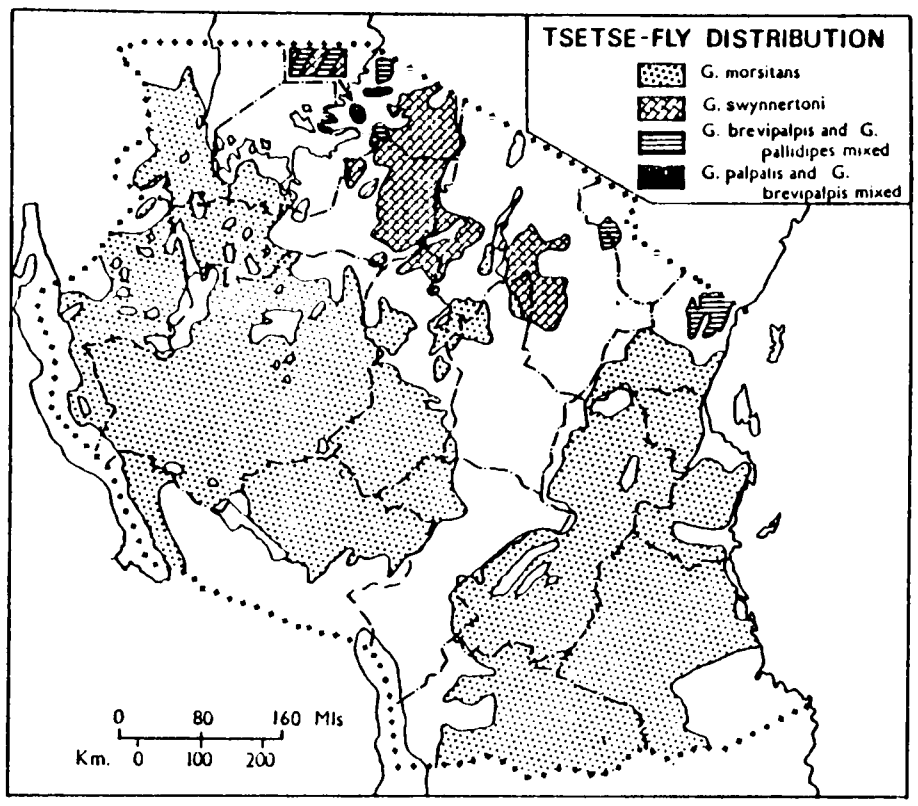


Source: I Thomas in Berry (1971), 109

MAP 1.2: Regions and Districts, 1978

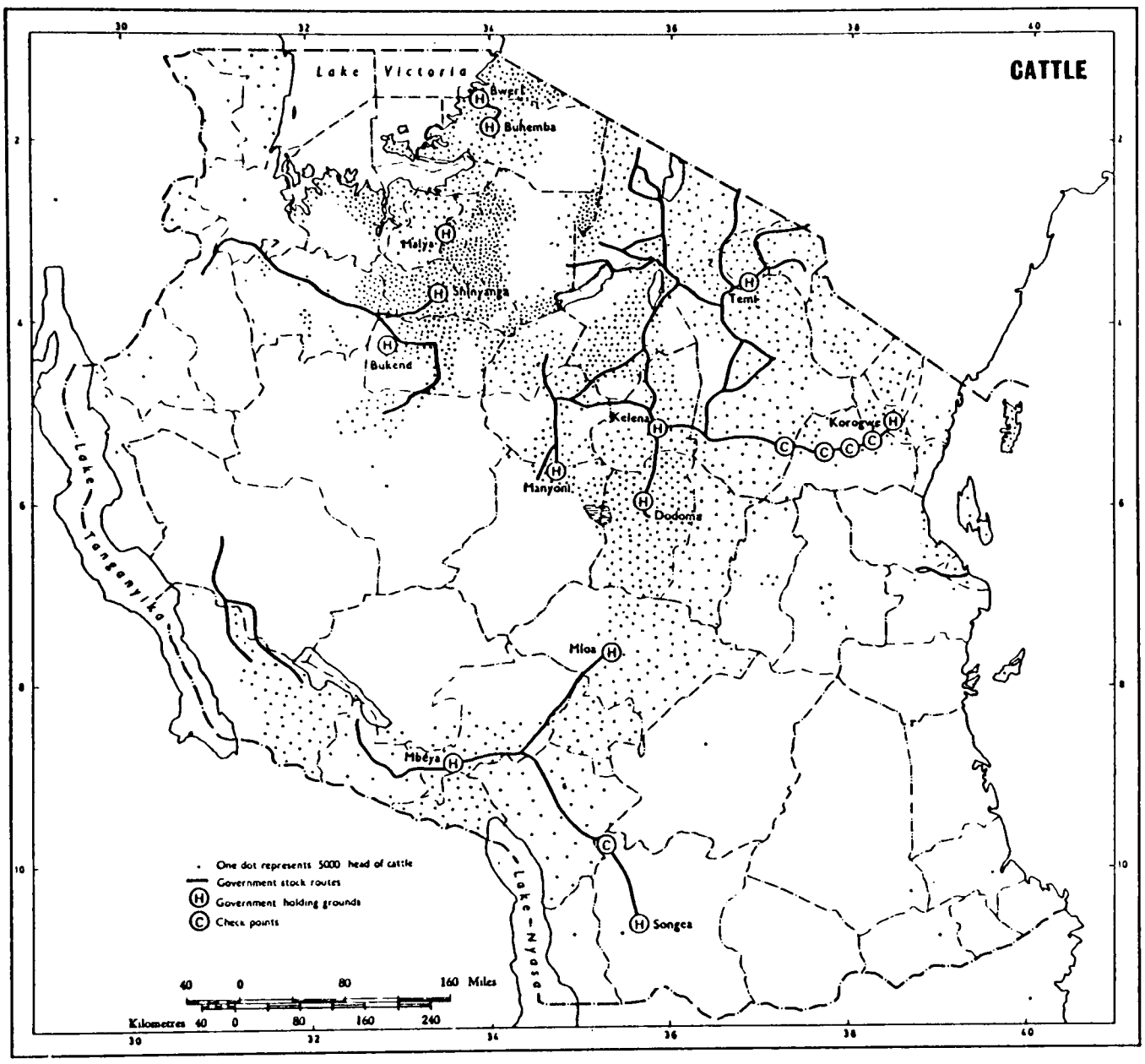


Map 2.1: Tsetse-Fly Distribution



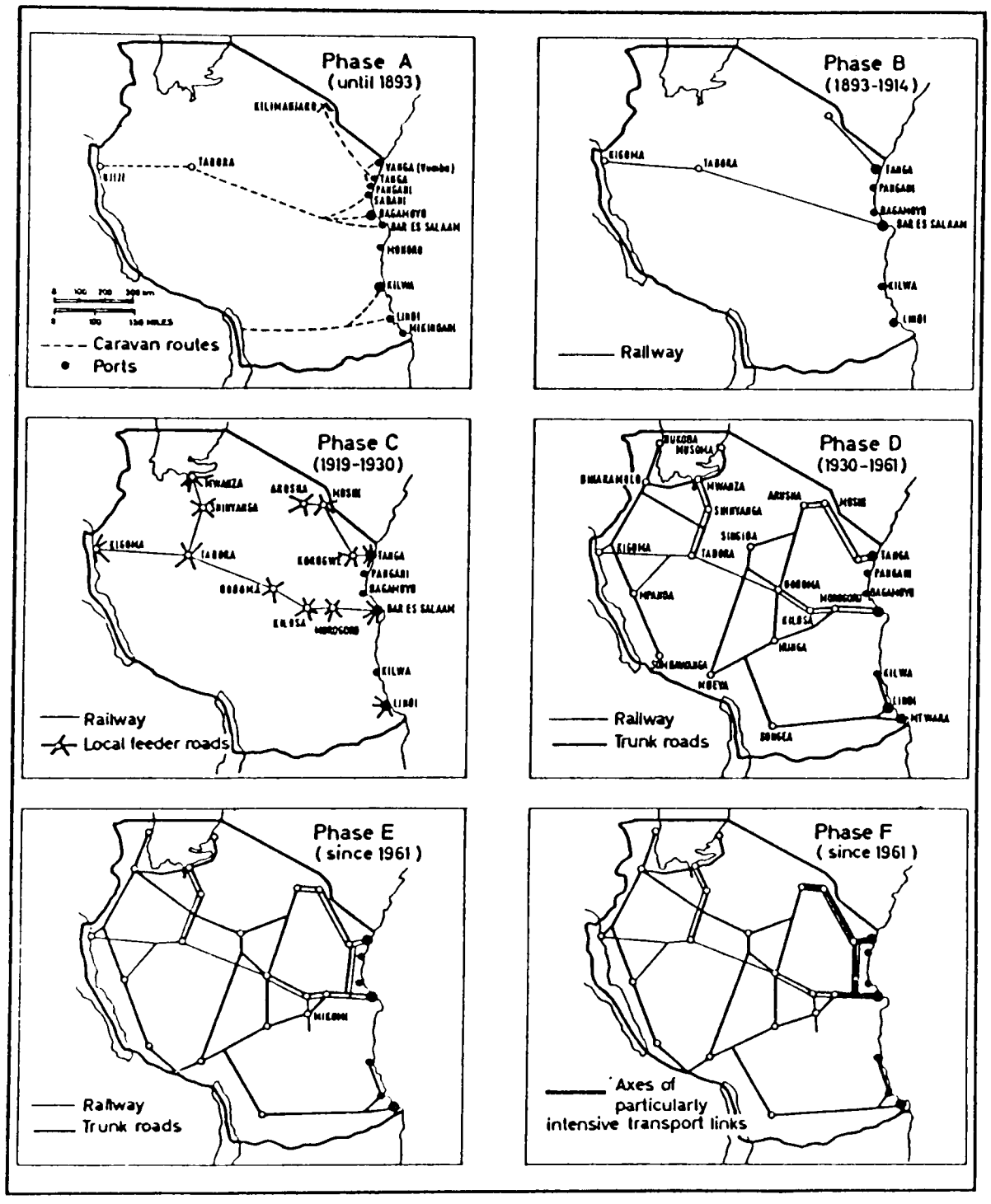
Source: J.E. Moore in Berry (1971), 65

Map 2.2: Cattle Distribution



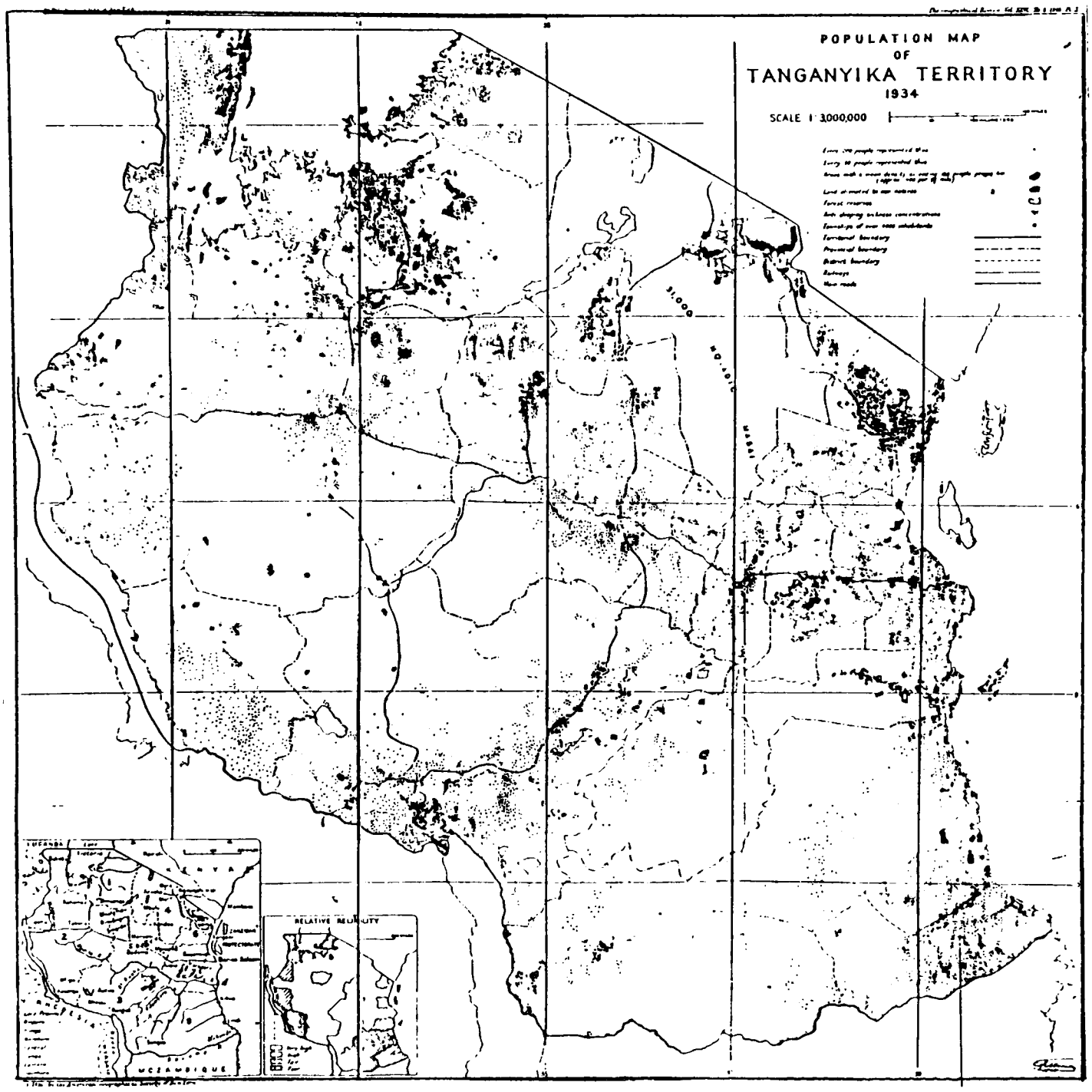
Source: J.E. Moore in Berry (1971), 63

Map 2.3: Development of the Transport Network



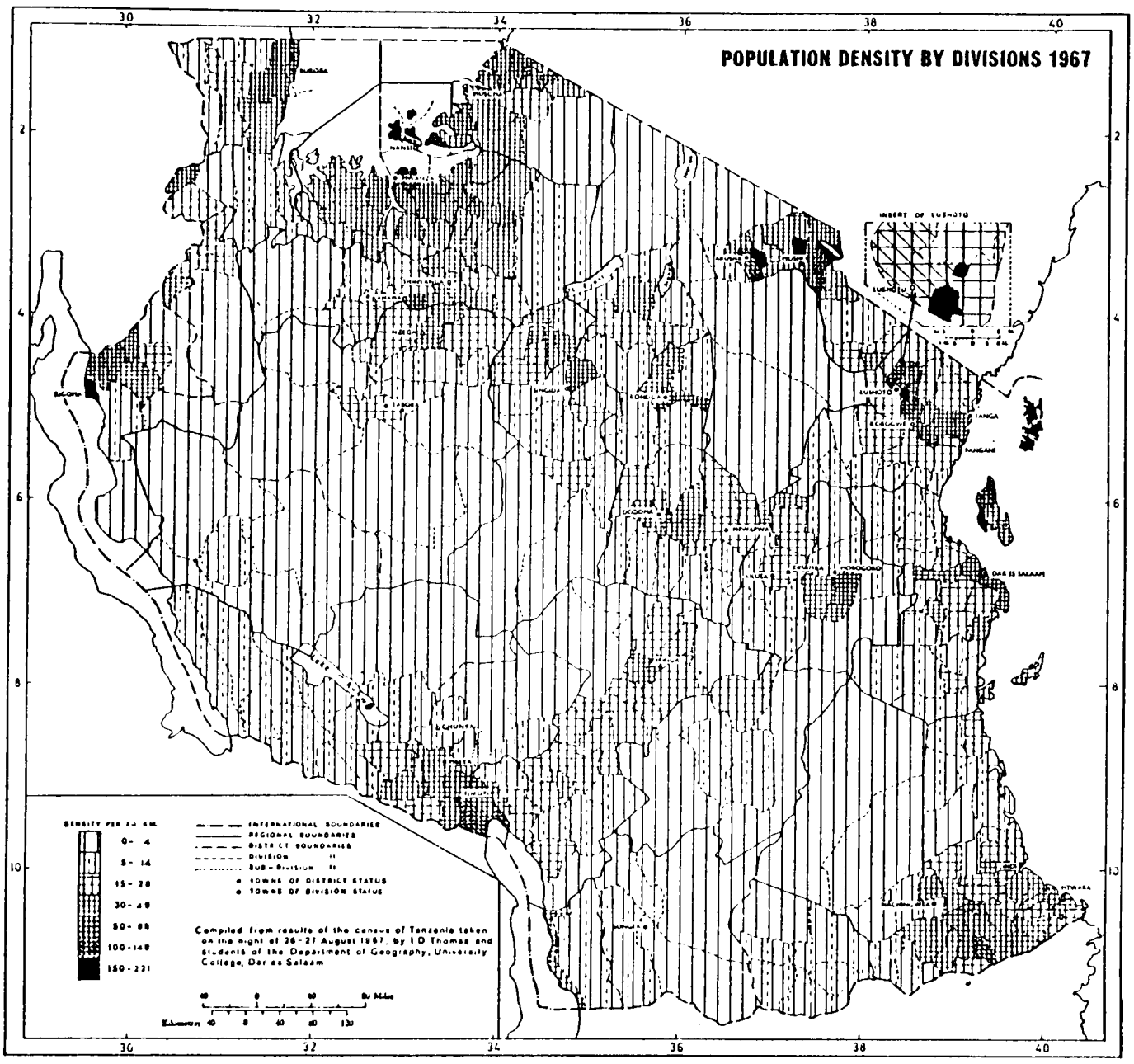
Source: Hofmeier (1973), 87

Map 2.4: 1931 Settlement Pattern



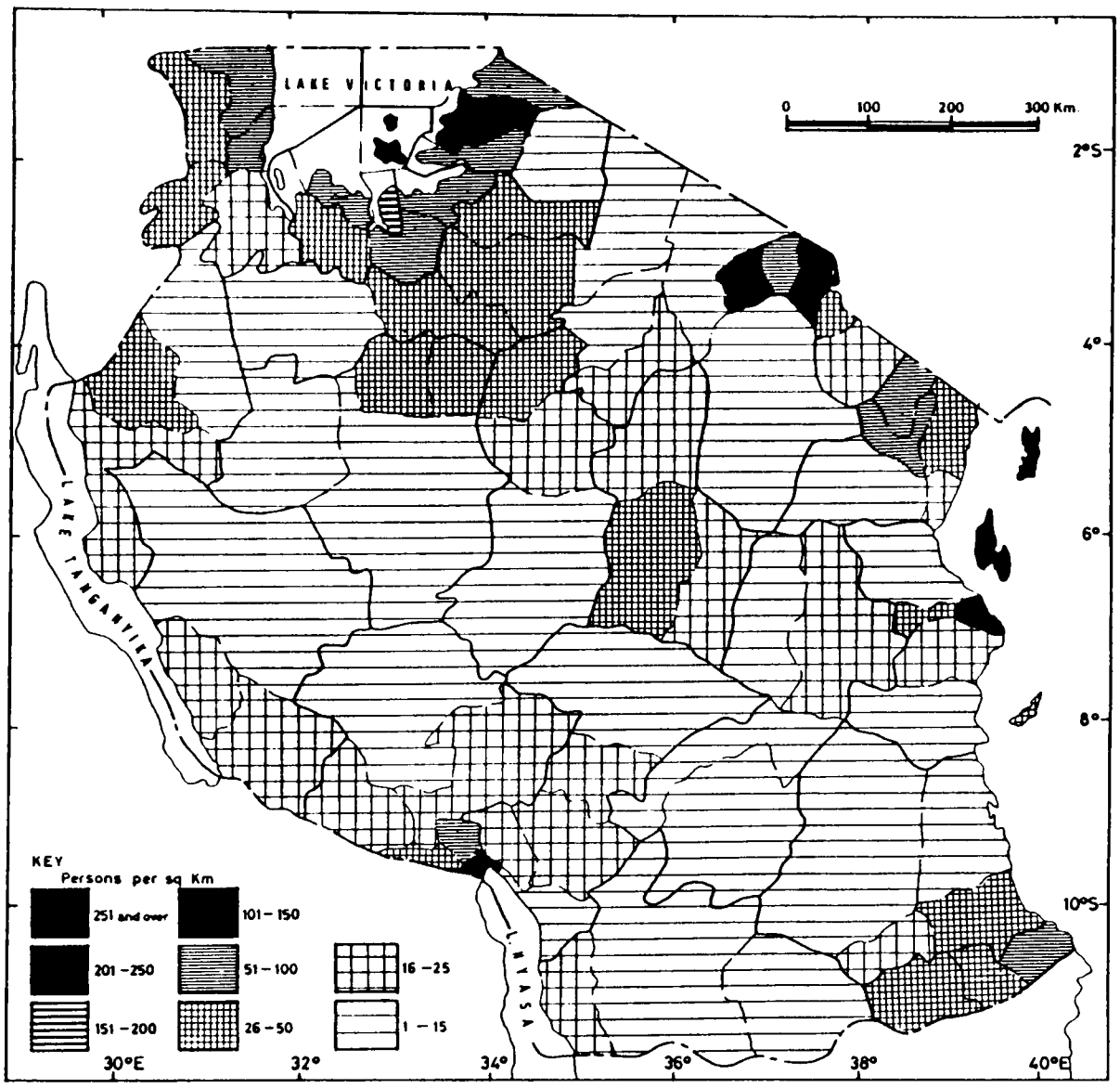
Source: Gillman (1936)

Map 2.5: 1967 Settlement Pattern



Source: I. Thomas in Berry (1971), 115

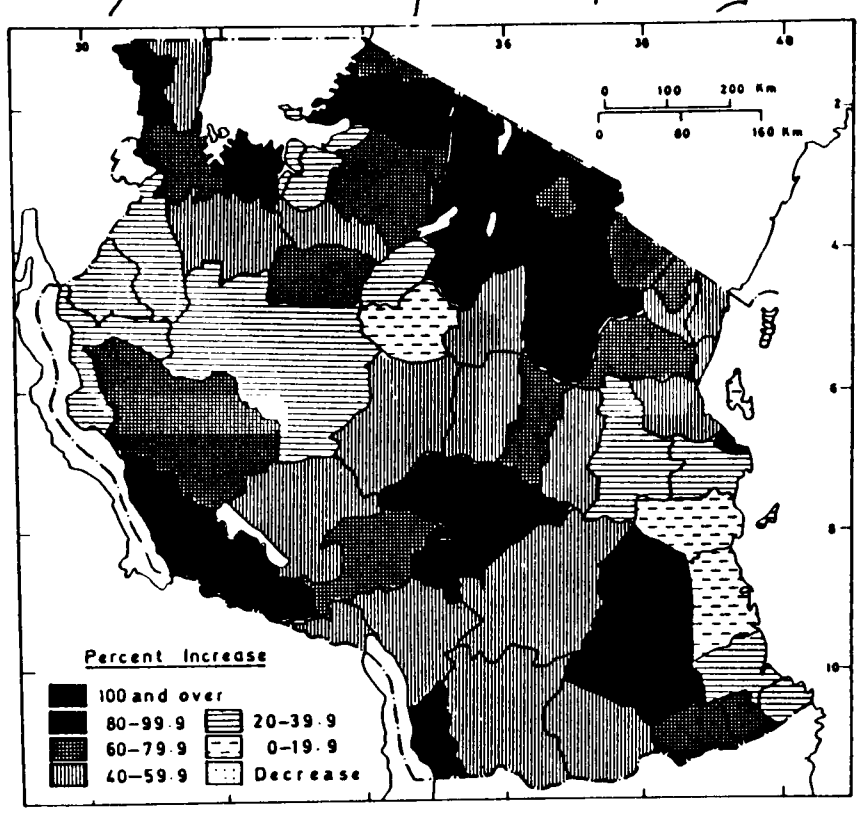
Map 2.6: 1978 Settlement Pattern



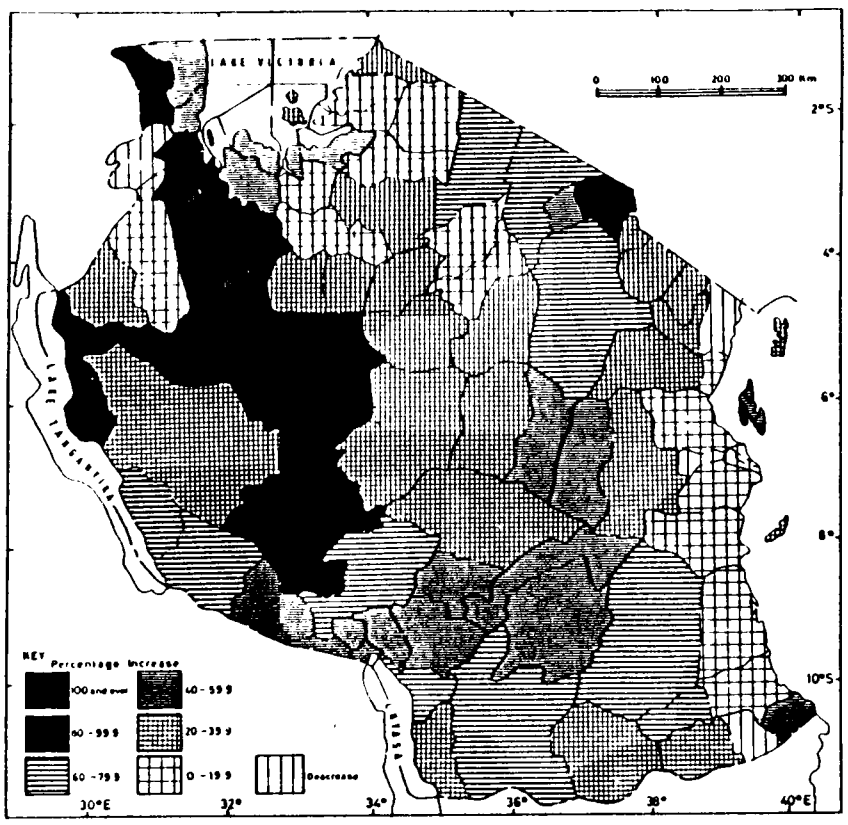
Source: Mara (1983), 102

MAP 2.7: Changes in Rural Population Density, 1948-67 and 1967-78

1948-67

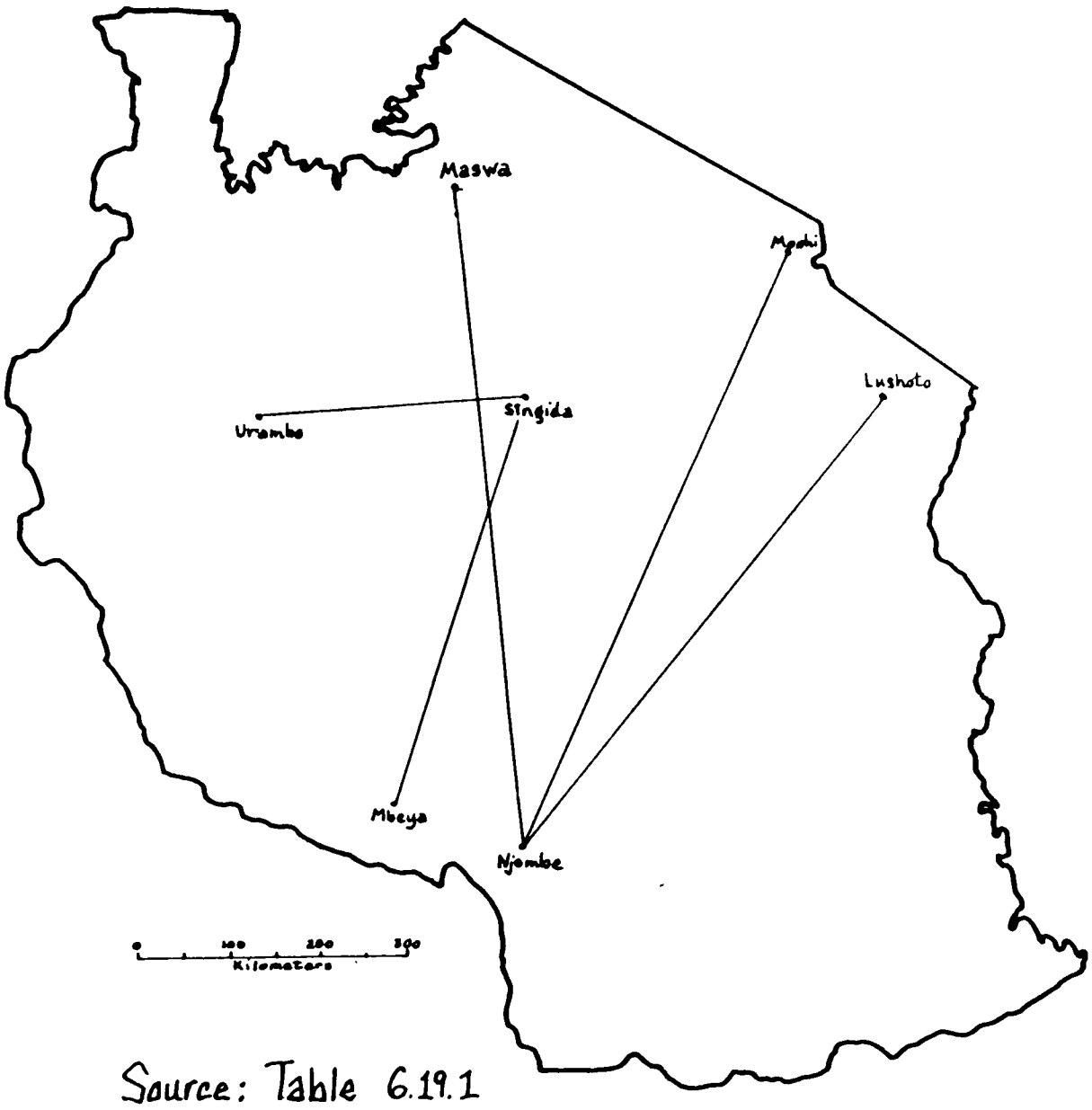


1967-78



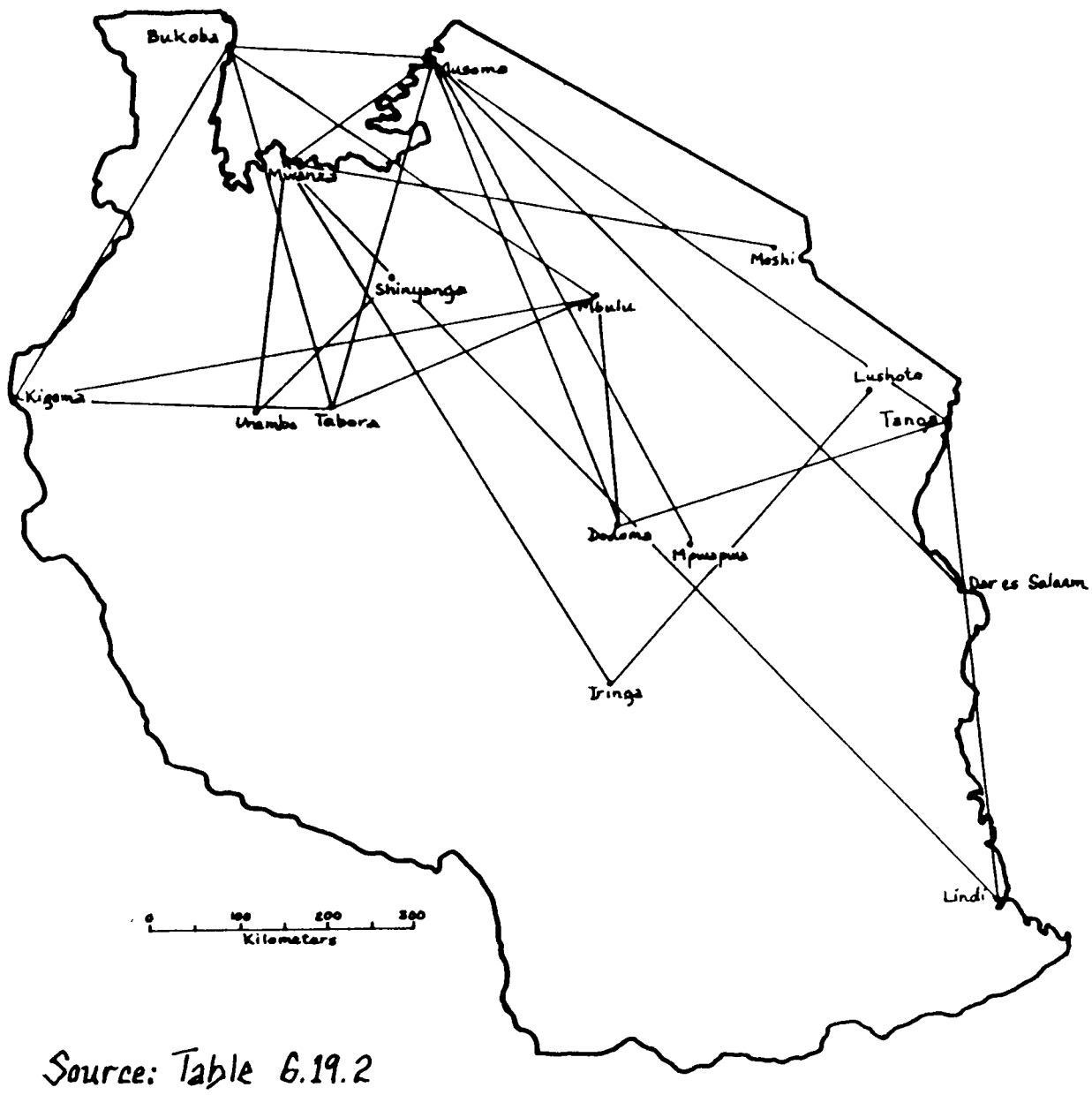
Sources: Moore (1973), 50 and Maro (1983), 104

MAP 6.1: Maize Correlations >.550



Source: Table 6.19.1

MAP 6.2: Rice Correlations >.550



Source: Table 6.19.2

APPENDIX II: FOOD CROPS IN TANZANIA

Maize is the most widely produced crop, with a estimated harvest of 1,673,000 tons in 1976/77. The other staple crops in order of tonnage ('000) are: bananas, 1492; dried cassava, 1278; sweet potatoes, 737; sorghum, 522; paddy, 314; millet, 221; Irish potatoes, 116; and wheat, 64.[1] The total kcal. ('000,000) energy units based on these production figures are: maize, 6.08; cassava, 3.01; bananas, 1.92; sorghum, 1.86; sweet potatoes, 0.85; millet, 0.80; rice, 0.72; and Irish potatoes, 0.09.[2]

In this appendix, various geographical and historical features of Tanzania's staple crops are reviewed as an accompaniment to TABLE II.1 which lists the main food crops for subsistence and commodity sale by region and district and includes information about yields.

1. Maize

Maize is not indigenous to East Africa. It is believed to have been introduced by Portuguese traders from the Caribbean in the 16th or 17th century.[3] It was primarily a coastal crop, although its cultivation spread inland during the 19th century caravan trade.[4] Following the introduction of new maize strains from South Africa, well-suited to upcountry conditions, maize began to rapidly replace millet and sorghum in peasant production. Maize has the advantage of being higher yielding in areas of satisfactory rainfall and is not subject to bird attack to the extent of some of the indigenous grains which require constant vigilance in the field when the crop is ripening to prevent

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[1] These are estimates of the Ministry of Agriculture statistical section, based on regional agricultural officers guessestimates. Their reliability is questionable. The Marketing Development Bureau, an FAO-staffed research unit housed within the Ministry gives much lower estimates on the crops that they have analysed: e.g. maize, 897; paddy, 172 and wheat 65 tons (TFNC, 'Data Report on the Food and Nutrition Situation in Tanzania, 1974/75-1979/80', DSM, (1982), Tables 12.1 and 12.2).

[2] TFNC, 'Data Report', Table 24.1

[3] Greenway, P.J. 'Origins of Some East African Food Plants', EAAJ, (April 1945), 251

[4] Iliffe, Modern History, 69

severe crop losses. Land preparation, weeding and harvesting is less strenuous. Processing of maize is easier as well, since it does not entail threshing or winnowing.[5]

The unreliability of maize yields in years of below average rainfall and its susceptibility to stalk borers, armyworm and most recently scania somewhat offset its labour-saving advantages. Nonetheless, maize has become the most widely grown staple food throughout Tanzania during this century. Peasants grow maize even in semi-arid areas of Dodoma and Singida where the risks of crop failure are high.

In TABLE II.1, yields are estimated in the range of 800-1500 kg/ha. Recent estimates by the Marketing Development Bureau are more conservative at 700-1100 kg/ha.[6] Maize's fertilizer response varies a great deal from place to place.[7]

Nutritionally, maize ranks on a par with sorghum and millet though it is less rich in iron and niacin. It provides 400 kcal. and 11 kg of protein per hectare assuming a 1100 kg/ha average yield.

2. Bananas

For optimum growth, bananas require moisture year-round and are therefore found in Tanzania's highland areas where rainfall is abundant. Bananas are of Malayan origin but their cultivation in East Africa dates back over 600 years, probably having arrived on the African continent via Madagascar.[8] As perennials, once planted bananas require maintenance of soil fertility and attention

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[5] Acland, J.D. East African Crops, (London, Longman, 1975), 124

[6] Stainburn, J.M. 'Production Costs of Major Agricultural Commodities in Tanzania', MDB, R2/82, DSM, (1982), Table 1

[7] Marandu,, W.Y.F., A.P. Uriyo and H.O. Mongi, 'Residual Effects of NPK Fertilizer Application on the Yield of Maize and Pasture on a Ferrisol at Morogoro', EAAFJ 40(4), (October 1975), 179-192; Anderson, G.D. 'Responses of Maize to Application of Compound Fertilitzers on Farmer's Fields in Ten Districts of Tanzania', EAAJ 34, (January 1969), 382-397; Seab, G. and P.K. Garberg, 'Some Effects of Planting Date and Nitrogen Fertilizer in Maize', EAAFJ 34, (January 1969), 371-379; Duthie, D.W. 'Fertilizer Trials in East Africa', EAAJ 15, (October 1949), 46-47

[8] Greenway, 'Some Origins', (January 1945), 178

to insect and disease attack and weeding, but do not entail the labour strains of annual soil preparation, planting and harvesting. Bananas are often inter-cropped with coffee or beans.

Yields range between 4000 and 6500 kg/ha in TABLE II.1. Kajumulo-Tibaijuka records a much wider range of 3300 and 11,100 with a mean of 5500 in the Kagera villages she sampled. At present, yields in Kagera are seriously affected by the infestation of banana weevil and nematodes. In areas, where the infestation has reached crisis levels, farmers are turning to sweet potato production.[9]

Assuming an average yield of 5000 kg/ha, 645 kcal energy units and 5 kg. of protein would be produced. Low in Vitamin B relative to the cereals, bananas are however rich in Vitamins A and C.

3. Cassava

Cassava is another plant from Central America that owes its existence in East Africa to the Portuguese.[10] It is a crop that requires very little labour after planting and can be left in the ground unharvested for several years, saving the farmer from storage losses due to pest attack and providing a famine reserve. It is drought-resistant and highly-valued for its immunity to locust invasions. Unlike grain crops, cassava yields hardly fluctuate from year to year. The less common short-term cassava is a useful emergency crop to plant when the rains fail.[11] On the debit side, cassava has a lower nutritional value than all other grain and root crops and some varieties grown in some places contain cyanogenic glucoside that can cause hydrocyanic poisoning if precautions are not taken in its preparation for consumption. In Dodoma and Singida where the drought-resistance of cassava would be very useful, cassava is not grown because these are cattle-keeping areas; cattle graze on cassava leaves and kill the plant. In most parts of Tanzania, cassava leaves are used to make a vitamin-rich relish which helps to offset the tuber's poor nutritional content.

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[9] Kajumulo-Tibaijuka, Economic Analysis, 89,112-122

[10] Greenway, 'Some Origins', Part I, (July 1944), 36

[11] Allnutt, T.B. 'Long-Term and Short-Term Cassavas', EAAJ 10, (July 1944), 57

Unlike bananas, cassava production is not restricted to any particular climatic or geographical zone. Apart from the fact that it does not grow well in colder climates with altitudes above 1,500 metres, its distribution is very wide and has been strongly influenced by social factors. TABLE II.1 shows that cassava is an important staple in over half of the districts. It is a popular crop in areas where labour time constraints have existed and this pertains both to areas of heavy male out-migration leaving women with the full burden of household production and in sisal plantation areas. The southern districts of Lindi, Mtwara, Masasi and Nachingwea have historically been reliant on cassava. Cassava is also important in the cultivation steppe districts of Mwanza, Kwimba and Geita, where land and labour shortages have been experienced with the expansion of peasant household cotton production. Cassava is used as a last crop before letting the land revert to a three-year fallow.[12] Cassava has very low nutrient requirements so it is resorted to at the end of a crop sequence or sometimes at the beginning after land clearance without burning which causes a temporary lack of nitrogen. Fertilizer usage is not recommended for cassava.[13]

Cassava yields range between 6000 and 7000 kg/ha. A yield of 6,000 kg/ha. provides 918 kcal., 4.2 kgs. of protein and Vitamin C.

4. Sweet Potatoes

Sweet potatoes, like cassava, are very drought resistant. They can grow in warm and cold climates and are therefore found in the higher altitudes that are unsuitable for cassava between 1500 and 2100 metres. Timely planting is not a constraint; they can be planted at anytime of the year when there is sufficient soil moisture. They are often planted in mounds and ridges to enhance drainage and require little weeding. Like cassava they are frequently used as the last crop before fallowing. Storage of fresh tubers cannot be extended beyond a few days, so they are harvested in

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[12] Scaife, A. 'The Effect of a Cassava "Fallow" and Various Manurial Treatments on Cotton at Ukiriguru Tanzania', EAAFJ 33, (January 1968), 235

[13] Acland, East African Crops, 35

small amounts for immediate consumption. There are innumerable varieties of sweet potatoes. The major drawback to sweet potato cultivation is the threat of virus B which causes degeneration of the varieties overtime.

Yields vary between 4500 and 5000 kg/ha. In 4500 kg of sweet potatoes 516 kcal. and 6.8 kgs of protein are obtained. Fertilizer response has not been encouraging.

5. Sorghum

Sorghum is believed to be the first indigenous African plant to be domesticated. Bantu-speaking people found it being grown by Kushites in East Africa when they first arrived. The cultivation of sorghum and millet enabled the Bantu to spread into Tanzania's savannah areas over the last thousand years.[14] Next to bulrush millet, sorghum is the most drought-resistant grain and the serena improved variety developed in the late 1960s is especially well-adapted to drought.[15] Sorghum's hardiness extends to being capable of withstanding short periods of water-logging as well. Early planting, just as the rains begin, improves yields. Sorghum is plagued by the parasitic weed striga which thrives on the exudates of sorghum roots and spreads rapidly if precautions are not taken such as hand-pulling of the weed and rotation of other crops that do not encourage striga growth.[16] Sorghum's open panicle and small grains makes it vulnerable to bird attack, especially that of the quelea quelea. Quelea quelea breed in large numbers in the dry central area near Dodoma and migrate outwards throughout Tanzania, attacking other crops like wheat in very dry years when crops in the central area have failed. Bitter red varieties of sorghum for beer brewing do not attract birds as much as the sweeter, more palatable white varieties. The birds can cause devastation to sorghum

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[14] Gwynne, M.D. 'The Origin and Spread of Some Domestic Food Plants of Eastern Africa', in Chittick, H.N. and R.I. Rotberg (eds.), East Africa and the Orient: Cultural Synthesis in Pre-Colonial Times, (New York, African Publishing Co., 1975), 257-259

[15] Channer, G.W. 'A Brief Review of Sorghum Research in Eastern Tanzania', EAAJ, Special Issue, (1973), 25

[16] Doggett, H., 'Striga hermonthica on Sorghum in East Africa', Journal of Agricultural Science 65, (1965), 183

fields unless guarded against. While children have traditionally had the task of scaring away birds from ripening crops, the gradual absorption of more and more children into the school system has been one factor in reducing sorghum hectarages.

Sorghum is responsive to fertilizer usage and farmyard manure, but peasants rarely apply either to sorghum. TABLE II.1 lists the sorghum yield as 1000 kg/ha. This accords with Acland's range of between 500 and 1500. Serena is however capable of yielding 3000-4000 with good husbandry.[17] With a 1000 kg/ha yield, 354 kcal and 10.4 kg of protein are obtained.

6. Paddy

Rice, or paddy which is unhusked rice, originated in Asia, and spread to East Africa before the Portuguese arrived.[18] Historically, rice has been the favoured food of the Arab and Asian minorities living in Tanzania's towns. In rural areas of the Islamic coast, it has been highly valued as a food for festive occasions. Rice is an important crop in western Tanzania south of Lake Victoria, around Lake Nyasa in the south, in areas of poor drainage in low and medium-altitude parts of the country and in the Pangani, Ruvu and Rufiji river valleys of the coastal strip. Like wheat, rice has served primarily as a cash crop rather than a subsistence crop because of its high demand in urban areas.

The river valley rice is directly sown on the banks of the receding river and its tributaries. However, if the rains are heavy and erratic, causing the river to over-flood, the seedlings can get completely submerged and die. In the absence of control over the water level, rice cultivation in this manner bears a high risk of failure.[19]

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[17] Acland, East African Crops, 189

[18] Greenway, 'Some Origins', (April 1945), 251

[19] Bantje, H. 'The Rufiji Agricultural System: Impact of Rainfall, Floods and Settlement', BRALUP Research Paper No. 62, (1979), 4

In other parts of Tanzania, rice is grown in small fields only about 1/20th of a hectare, making regulation of the water level possible. These are generally spots where natural seepage occurs. After the direct sowing of the seed, early flooding can prevent the seed from germinating and again the water level is critical to plant growth.

In western Tanzania, the germination problem is avoided by transplanting rice. It is an exceedingly labour-intensive practice but is sustained by rice's status as a cash rather than subsistence crop. Acland estimates that 1350-2200 man hours per ha. are devoted to this type of rice production.[20] Rice production was introduced into Western Tanzania in the late 1930s, and was readily accepted because it used land with poor drainage, unsuitable for anything else, and field preparation did not conflict with the local peak labour season.[21] Weeding is not tedious if the field has been properly flooded.

Rice is fertilizer responsive but rice farmers hardly ever use it. In TABLE II.1, yields are estimated at 1500 kg of paddy per hectare which is equivalent to 975 kg rice. This amount yields 345 kcal and 6.8 kg protein per hectare.

7. Millet

Millet is indigenous to East Africa. Most of the millet grown in Tanzania is bulrush millet (Pennisetum typhoides) rather than finger millet (Eleusine coracana). Because of its low-yielding properties and vulnerability to bird attack, finger millet has increasingly been displaced by maize or otherwise edged out of crop rotations. The cultivation of bulrush millet has also declined over the years, but not to the same extent. It is highly drought resistant and does well on infertile sandy soils where maize would not thrive. Bulrush millet is especially resistant to insect attack,

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[20] Acland, East African Crops, 166

[21] Allnutt, R.B., 'Rice Growing in Dry Areas', EAAJ 8, (October 1942), 103-105

unlike maize.[22] It was the most important crop in the cultivation steppe before the 1950s, but has given way to maize for the same reasons as above. Millet is fertilizer responsive.[23]

Its yield has been estimated in the range of 900-1200 kg/ha. A 1000 kg/ha yield is equivalent to 363 kcal and 11 kg of protein and is rich in Vitamin B.

8. Irish Potatoes

Irish potatoes were introduced into Tanzania during the colonial period. They grow well in colder highland areas and are grown in the Southern Highlands, particularly Njombe and Mbeya for food. In other places, where they appear, they often serve as a minor cash crop for the urban market.

Potatoes are more prone to blight in tropical than temperate climates.[24] In addition to blight, there is bacterial wilt and viruses X and Y and pests, notably the potato aphid, the tuber moth and nematodes which all plague the potato and prevent it from becoming a main food crop anywhere in Tanzania.

Acland estimates yields at 5000-7000 kg/ha.[25] At 6000 kg/ha potatoes offer 459 kcal and 12 kg of protein.

9. Wheat

Wheat can grow in the highland areas between 1800 and 2900 metres in altitude. Below that, the climate is either too dry for adequate plant growth or too humid, with a high incidence of disease. Much of the wheat in Tanzania is grown on large mechanized farms, previously, in the hands of white

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[22] Staples, R.R., 'Combatting Soil Erosion in the Central Province of Tanganyika Territory', Part I, EAAJ 7, (1942), 6

[23] Judy, W.H., 'Bulrush and Finger Millets in Tanzania', EAAFJ, Special Issue (1973), 32

[24] Linton, R.D., 'Observations on European Potatoes in Tanganyika', EAAJ, (July 1947), 21

[25] Acland, East African Crops, 149

settlers, but now operated as state farms. Peasant production of wheat is widespread in Njombe and is found to a lesser extent in Mbozi, Mbeya, the Matengo highlands and Mbulu. Wheat requires soils with a high nutrient content and good drainage. The absence of severe cold weather precludes the cultivation of winter wheat anywhere in Tanzania. Only spring wheats can be grown, but climatic factors pose problems for it as well. Without a period of cold weather, there is no check on the various rust diseases caused by fungus.

Because of the different rainfall regimes in East Africa, wheat exists at a susceptible stage of growth in virtually every month of the year somewhere. As a result East African agricultural research stations have continously endeavoured to stay one step ahead with the development of new varieties, even before the previously introduced new varieties succomb to rust.[26] Other fungus diseases affecting wheat are: loose smut, take all, leaf blotch and glume blotch. Pests that attack wheat include: the dusty brown beetle, the black wheat beetle, barley fly, aphids and quelea quelea birds.

TABLE II.1 lists wheat yields in the range of 1000-1500 kg/ha. Acland's average yield figure is 1100 kg/ha.[27]

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[26] Edwards, K.D., 'The Development of Wheat Seed Production in Southern Tanzania', EAAJ, Special Issue, (1973), 19; Three years was a variety's average period of rust resistance on West Kilimanjaro (Interview with B. Freyberg, 4/4/81).

[27] Acland, East African Crops, 244

TABLE II.1: APPROXIMATE FOOD CROPPING PATTERNS BY REGION AND DISTRICT DURING THE MID-1960S[1]

REGION/ District	MAIN SUBSISTENCE FOOD CROPS (Kg/Ha Yields)[2] and FOOD CASH CROPS (%)[3]: Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
ARUSHA								
1) Arusha mountains:	1500	5000						
2) Arusha plains:	1000 (30%)							(10%)
3) Masai:	900 (20%)							(10%)
4) Mbulu (lower):	1200			1200 (20%)				(50%)
5) Mbulu (higher):	1000 (30%)			1000				
6) Mbulu (dry):	800 (10%)		XX[4]		1000			
COAST								
1) Bagamoyo coast:	1200		XX				6000	
b) Bagamoyo inland:	1200						6000	
3) Kisarawe coast:	1200						6000	
4) Kisarawe inland:	1200						6000	
5) Mafia:	1500				-		6000	
6) Rufiji coast:						4500	6000	
7) Rufiji valley:			1500 (80%)				6000	
8) Rufiji zone c:						4500	6000	
9) Mzizima:	1200						6000	

[1] Derived from Moore's reconstruction of the cropping pattern of sub-districts using information from the report 'District Data, 1967' and Tanzania's second five-year plan (see Sources).

[2] The two main subsistence food crops are listed in the first row by yield.

[3] The cash food crops are listed in the second row by estimated percentage of total household income.

[4] 'XX' denotes areas where paddy is grown primarily for sale on land that is water-logged or otherwise unfavourable for other crops.

TABLE II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
DODOMA								
1) Dodoma:	800			900				
2) Kondoa:	800 (50%)			900				
3) Mpwapwa:	800 (50%)			900				
IRINGA								
1) Iringa zone a:	800 (50%)		(10%)					
2) Iringa zone b:	1500 (10%)							(20%)
3) Mufindi zone a:	1500 (20%)							(20%)
4) Mufindi zone b:	800 (40%)					4000		
5) Njombe zone a:	1500							(10%)
6) Njombe zone b:	800 (30%)							(10%)
KAGERA								
1) Biharamulo:	1500	6000						
2) Bukoba:		6500 (20%)						
3) Karagwe:		6500 (20%)						
4) Ngara:		6500 (40%)						

TABLE II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
KIGOMA								
1) Kasulu zone a:	1200 (20%)	(30%)						
2) Kasulu zone b:	1200 (20%)						6000	
3) Kibondo:	1200			1200 (40%)				
4) Kigoma zone a:	1200		(20%)				6000 (40%)	
5) Kigoma zone b:	1200 (20%)	7000						
KILIMANJARO								
1) Kilimanjaro mountains:	1500	6500 (20%)						
2) Kilimanjaro plains:	1200 (25%)			(25%)				(25%)
3) Pare mountains:	1500	5000						
4) Pare zone b:	1000 (40%)							
MARA								
1) Musoma zone a:	1200		XX				6000 (25%)	
2) Musoma zone b:	1200			1200 (25%)				
3) North Mara zone a:	1500 (20%)	(10%)		1200 (10%)				
4) North Mara zone b:	(40%)		XX	1200 (30%)			6000 (30%)	

TABLE 2.II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
MBEYA								
1) Mbeya zone a:	1500							(10%)
2) Mbeya zone b:	800 (60%)		1500 XX					
3) Mbozi zone a:	1500 (10%)							1500 (20%)
4) Mbozi zone b:	1000 (30%)		XX	1000 (50%)				
5) Rungwe zone a:	1500	6500 (10%)						
6) Rungwe zone b:		6500	1500 (70%)					
7) Chunya:	900 (20%)			900				
MOROGORO								
1) Kilosa:	1100 (20%)		(10%)	(30%)		4500		
2) Morogoro zone a:	1500	5000						
3) Morogoro zone b:	1200 (30%)							6000
4) Ulanga:	1200		XX	1200				
LINDI								
1) Kilwa:	1200		XX					6000
2) Lindi:	1200		XX					6000
3) Nachingwea:	1200 (20%)		XX					6000

TABLE II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
MTWARA								
1) Masasi:								
	1200						6000	
			XX					
2) Mtwara:								
	1200						6000	
			XX				(20%)	
3) Newala:								
	1200						6000	
			XX				(40%)	
MWANZA								
1) Geita:								
	1200						6000	
			XX				(20%)	
2) Kwimba:								
	1000			1200				
			XX			(20%)	(10%)	
3) Mwanza:								
	1200						6000	
			XX				(20%)	
4) Ukerewe:								
							6000	
			XX				(20%)	
RUKWA								
1) Sumbawanga:								
	1200			1100				
				(40%)				(20%)
2) Mpanda:								
	1200			1200				
	(50%)		XX					
RUVUMA								
1) Mbinga:								
	1200			1200				
			XX					
2) Songea:								
	1200							
	(25%)							
3) Tunduru:								
	1300						6000	
	(20%)		XX					

TABLE II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
SHINYANGA:								
1) Kahama zone a:								
	1200						6000	
	(20%)		XX					
2) Kahama zone b:								
	1200						6000	
3) Maswa:								
	1000			1000				
	(10%)							
4) Shinyanga:								
	1000			1000				
	(25%)							
SINGIDA								
1) Iramba zone a:								
	900			1000				
2) Iramba zone b:								
	900			1000				
3) Manyoni:								
	800			900				
4) Singida:								
	900			1000				
				(30%)				
TABORA								
1) Tabora:								
	1200						6000	
	(40%)		XX					
2) Nzega zone a:								
	1000						5000	
	(20%)		XX					
3) Nzega zone b:								
	1200			1200				
	(30%)		XX					

TABLE II.1: CONTINUED

REGION/ District	Maize	Bananas	Paddy	Millet	Sorghum	SwPotato	Cassava	Wheat
TANGA								
1) Handeni zone a:								
	1000						5000	
2) Handeni zone b:								
	1000						5000	
	(30%)							
3) Handeni zone c:								
	livestock only							
4) Korogwe zone a:								
	1500	4000						
5) Korogwe zone b:								
	1000						5000	
	(40%)		XX					
6) Lushoto zone a:								
	1500	4000						
7) Lushoto zone b:								
	800							
	(20%)		XX					
8) Pangani:								
	1200						6000	
	(20%)	(20%)					(20%)	
9) Tanga zone a:								
	1500	4500						
		(20%)						
10) Tanga zone b:								
	1200						6000	
							(20%)	
11) Tanga zone c								
							6000	
							(20%)	

Sources:

1) Moore, J.E. 'Rural Population Carrying Capacities of the Districts of Tanzania', BRALUP Research Paper No. 18, (1971), 5-40
2) Mkama, J. and S. Jensen, 'District Data, 1967', DSM, Ministry of Economic Affairs and Development Planning, (1968)
3) Tanzania, Second 5-Year Plan for Economic and Social Development, 1969-1974, Vol. I, (DSM, Government Printer, 1969)

APPENDIX III: PHYSICAL CAUSES OF FOOD INSECURITY

East Africa has been identified as an area of the world particularly prone to food shortfalls.[1] The two scholars who have probably studied and written about Tanzania in the greatest depth, the historian John Iliffe and the geographer Clement Gillman regard the country as a harsh and uncertain environment for agrarian settlement.[2]

Tanzanian peasants have a profound appreciation of the ecological constraints. Their farming practices are highly risk-averse. Three main physical constraints hamper if not threaten agricultural output: erratic rainfall, pest attack and rapid depletion of soil fertility.

1. Rainfall

Except for the well-watered highland areas, which constitute only a small portion of Tanzania's land surface area, peasant cultivators have had to adopt farming practices that are conducive to low and seasonally erratic rainfall. Roughly 55% of Tanzania does not receive 750 mm annual rainfall on a regular basis, an amount considered to be the minimum required for most forms of crop cultivation (MAP III.1).[3]

In addition to low total amounts of rainfall, much of the country is transitional between a unimodal and bi-modal rainfall pattern making rainfall highly variable from year to year. The seasonal concentration of rainfall makes early planting of utmost importance.[4] If the rains are delayed, replanting, sometimes repeatedly, becomes necessary.

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[1] Masefield, G.B., Famine: Its Prevention and Relief (London, Oxford University Press, 1963), 16-17

[2] Iliffe, Modern History, 6-20 and Gillman, C. 'Population Problems of Tanganyika Territory', EAAJ 11, (October 1945), 86

[3] East African Royal Commission, EARC 1953-1955 Report (London, HMSO, 1955), Map 3, 252-254

[4] Nieuwolt, 'Seasonal Droughts', 208-222

2. Pests and Plant Diseases

Pest attack and plant diseases are often temperature and humidity-dependent, causing adverse weather and infestation to coincide. Food crop loss due to disease and pest attack in the field cannot be estimated, while post-harvest storage losses are reckoned at 20-30%.[5] Chemical control of pests and plant diseases is not practiced by most farmers and was virtually absent in African farming before the 1950s. The cultivation of mixed crop stands in numerous plots was the farmer's main and sometimes only means of preventing plant diseases and insect attack.

The plant diseases that most seriously affect grain and root crop yields in the field are streak and mosaic-disease and the parasitic weed, striga.[6] Pests are seemingly endless in number and range in size from elephants to microscopic mites.[7] Of the insects, locust have probably caused the most drastic losses, especially in the 1930s.[8] Since the 1940s, cooperation with neighbouring East African countries in locust surveillance has helped to reduce the risk of sudden, unexpected attack.[9] Army worms are like locusts, harmless in small numbers, but multiplying quickly with increased

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[5] Mosha, A. 'Kuhifadhi na Kudunduliza Mazao Yaliyo Muhimu', Tanzania Food and Nutrition Journal 1, 1976, 8

[6] Fuggles-Couchman, N.R. 'A Parasitic Weed of Sorghums (Rhamphicarpa veronicaefolia Vatke)', EAAJ 1, (September 1935), 145-147; Storey, H.H. 'Virus Disease of East African Plants: Streak Disease of Maize', EAAJ 1, (May 1936), 471-475; Tidbury, G.E. 'A Note on the Yield of Mosaic-Diseased Cassava', EAAJ 3, (September 1937), 119; Nichols, R.F.W. 'The Brown Streak Disease of Cassava: Distribution, Climatic Effects and Diagnostic Symptoms', EAAJ 15, (January 1950), 154-160

[7] Teare, S.P. 'The Relation of Game to Agriculture', EAAJ 4, (September 1938), 153-154; Robertson, J. 'A Note on the Poison Bait used for Rodents in the Kilosa District of Tanganyika Territory', EAAJ 4, (September 1938), 151-152; Duerden, J.C. 'Stem Borers of Cereal Crops at Kongwa, Tanganyika, 1950-52', EAAJ, (October 1953), 105-112; Shukla, P.T., 'Preliminary Report on the Green Mite (Monoychellus tanajoa, Bonder) Resistance in Tanzanian Local Cassava Varieties, EAAFJ, 42(1), (1976), 55-59

[8] Collett, R.W., 'The Destruction of Locusts by Beating', EAAJ 11, (July 1945); Michelmore, A.P.G., 'The International Red Locust Control', TNR 20, (1945); Swynnerton, R.J.M., 'The Use of Transport and Poison Bait in a Locust Campaign', EAAJ 11, (April 1946), 224-230; Harris, W.V., 'Locusts (Tanganyika)', Agriculture Department Publication, (1947); Backlund, H.O., 'Small Patches with Permanent Red Locust Population in Northern Tanganyika Territory', EAAJ, (January 1955), 202-204; Gunn, D.L., 'A History of Lake Rukwa and the Red Locust', TNR, 42, (1956), 1-18; Gunn, D., 'Locusts Ascending: How a Red Locust Outbreak was Crushed', TNR 58/59, (1962), 163-171

[9] Allan, African Husbandman, 48

temperature, causing decimation to crops.[10] Others, such as the banana borer and nematodes, spread more gradually over several years as a result of neglectful crop husbandry, to become a major drain on crop yields.[11] The protection of ripening grain crops against bird attack requires constant vigilance in the field in the final stages of plant growth.[12] Quelea quelea birds are particularly troublesome and in some areas during dry years can invade in vast, undeterrable numbers.[13]

Once food crops are harvested and stored they are subject to fungus and further insect attack, being particularly prone to weevils. Often peasants' storage methods have been blamed; storage in the rafters of the house or in simple containers made of local materials offer little protection from insect and rodent attack.[14] Exhortations to peasants to improve their grain storage and to shell maize instead of storing it on the cob have been made to try to check the rapid spread of a new pest, the insect locally referred to as 'scania', which causes severe damage to stored maize.[15] Native to

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[10] Harris, W.V., 'The Army Worm', EAAJ 10, (July 1944), 2-6; Dunstan, W.R., 'The African Armyworm', Bulletin of Research and Information 1(4), (1981), 31-35

[11] Harris, W.V., 'The Banana Borer', EAAJ 13, (July 1947), 15-18

[12] Fuggles-Couchman, N.R., 'Some Observations on Birds Raiding Rice Fields in Kilosa District, Tanganyika Territory', EAAJ 2, (July 1936), 54-59

[13] Fuggles-Couchman, N.R., 'The Destruction of Rice-Eating Birds', EAAJ 18, (October 1952), 77-78; Williams, J.G., 'The Quelea Threat to Africa's Grain Crops' EAAJ, (January 1954), 133-136; Disney, H.J. de S. and J.W. Haylock, 'The Distribution and Breeding Behaviour of the Sudan Dioch (Quelea Q Aethiopica) in Tanganyika', EAAJ 21, (January 1956), 141-147; Haylock, J.W. and H.J. de S. Disney, 'Control of the Sudan Dioch or Red-Billed Finch in Tanganyika', EAAJ 21, (April 1956), 210-217

[14] Harris, W.V., 'Notes on Food Storage', EAAJ 5, (March 1940), 385-386; Harris, W.V., 'Maize Storage', EAAJ 8, (April 1943), 190-196; Henricksson, R., 'Food Grain Storage in Tanzania', Report prepared for the Tanzanian Government by the Federation of Swedish Farmers Association, Stockholm, K-KONSULT-LBF Federation of County Agricultural Societies, (1968); Community Development Trust Fund of Tanzania, 'Appropriate Technology for Grain Storage in Tanzanian Villages; Report of a Pilot Project', DSM, (January 1977); Mosha, A.C., Hifadhi Vizuri Nafaka Yako, (DSM, Tanzania Food and Nutrition Centre, 1977), 1-61

[15] Golob, P. and R. Hodges, 'Study of an Outbreak of Prostephanus truncatus (Horn) in Tanzania', Tropical Products Institute, Overseas Development Administration, (1982), 1-23; Golob, P., 'Prostephanus Truncatus. The Larger Grain Borer in East Africa: The Development of a Control Strategy', Paper for the Third International Workshop of Stored Product Entomology, Manhattan, Kansas, (October 1983), 1-11

Central America, this insect is believed to have been introduced with some American food aid imports in the mid-1970s. Obviously, port authorities rather than peasants were responsible for the initial laxity and subsequent spread of the pest.

Peasants started using pesticides on cash crops, notably coffee and cotton. In the 1950s, pesticides were beginning to be sold in village shops.[16] Virtually no research has been done on the ecological effects of pesticides in Tanzania, although some suspect damage to human health and the environment are taking place as a result of poorly informed farmers' haphazard usage.[17] For example, the banana borer is now rampant in Kagera region as a result of its acquired resistance to dieldrin insecticide.[18]

3. Soil Fertility and Farming Practices

It was only after World War II, when soil surveys and experimentation become part of a conscious research programme under the auspices of the newly formed East African Agriculture and Foresty Research Organisation (EAAFRO), that colonial authorities appreciated how very different tropical soils were from soils in temperate climates.[19] High temperatures and low rainfall encourage rapid rates of oxidation which result in a low humus content in the soil and a consequent clayey soil texture rather than the desired crumb-like structure of temperate soils.[20] Hardpans, reduced water-

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[16] Walker, P.T., 'A Survey of the Use of Maize Stalk Borer Control Methods in East Africa', EAAJ 25, (January 1960), 165-168

[17] Mgeni found a correlation between pesticide exposure levels and frequency of medical complaints (Mgeni, A.Y., A Prospective Study of Pesticide Effects (Particularly Anticholinesterases) on Health of Exposed Workers in Tanzania, Masters Thesis, University of Zagreb (1978)).

[18] Kajumulo-Tibaijuka, 'Economic Analysis of Smallholder Banana-Coffee Farms', 116

[19] Keen, B., 'Presidential Address by Sir Bernard Keen, Director, E.A.A.F.R.O. at the Conference of the Medical, Agricultural and Veterinary Aspects of Food Production in East Africa,' EAAJ 20, (July 1954), 8

[20] Webster, C.C. and P.N. Wilson, Agriculture in the Tropics, (London, Longman, 1966), 56

holding capacity and soil acidity are common. Tropical downpours, often short in duration but of a very high intensity compact the soil causing drainage problems and leach the soil of nutrients. Rapid exhaustion of soil fertility is the net outcome of these physio-chemical processes.

It is difficult to isolate soil as a purely physical factor when farming practices are so influential in its maintenance. African farming practices have evolved around the soil fertility constraint. Allan's pioneering work, The African Husbandman, develops the concept of the 'land use factor', i.e. the ratio of fallow years to years of land cultivation, and distinguishes six levels of land use practiced in different soil/ecology zones of East Africa: permanent cultivation (2.0 or less), semi-permanent (2.5-3.0), recurrent cultivation (4.0-8.0), shifting cultivation (10 or over), partial cultivation land (area where small islands are cultivable in otherwise non-arable land) and uncultivable land.[21]

In Tanzania, the majority of land falls into the recurrent cultivation and shifting cultivation categories whereby cropping of three to four years must be followed by fallow periods of over twenty years to restore the natural fertility of the soil. Into these two categories, Allan has identified the farming practices of the Gogo of Dodoma, the numerous tribes inhabiting the vast miombo woodlands, the Mashokora cultivation of the coast, the Makuwa of Tunduru, and the Makonde thicket system of Ruvuma.[22] Fallowing of such a long duration results in a highly extensive form of agriculture, in which households are either widely dispersed through the countryside or are aggregated but subject to periodic relocation as land becomes exhausted. 'Shifting cultivation' has become the generic term for such farming practices and is associated with low population densities in the drier, tsetse-infested parts of the country. Permanent and semi-permanent cultivation, on the other hand, is found in the wetter, more fertile highland areas with the notable exception of Sukumaland, or 'cultivation steppe', where a cattle/cropping complex has evolved capable of

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[21] Allan, African Husbandman, 31-35

[22] Allan, African Husbandman, 208-218

supporting a large population density. Bananas are the staple of the highland areas in all but the coldest areas.[23] The Chagga of Kilimanjaro, the Haya of Bukoba, the Kara of Ukara island, the Nyakyusa of Rungwe, the Matengo of Songea, the Shambaa of the Usambaras, and the Luguru have all developed intensive forms of permanent agriculture.[24]

In the 1930s, the colonial government first became concerned with the problem of soil erosion, particularly in the arid Kondoa region of Central Province.[25] Over the years, more and more areas of soil degradation associated with population pressure were identified and the problem was attributed to three main factors: reduction of the fallow period[26], the expansion of populations into unfamiliar soil/ecology zones where their accustomed farming practices were not well-suited[27], and cattle over-stocking.[28] It was felt that traditional African farming practices, particularly shifting cultivation were undergoing rapid change without the requisite adjustments to safeguard soil fertility.[29]

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[23] E.g. Mufindi, Njombe, Loliondo, etc.

[24] Allan, African Husbandman, 162-206

[25] Anderson, D., 'Depression, Dust Bowl, Demography and Drought: The Colonial State and Soil Conservation in East Africa during the 1930s', African Affairs (83)332, (July 1984), 321-343

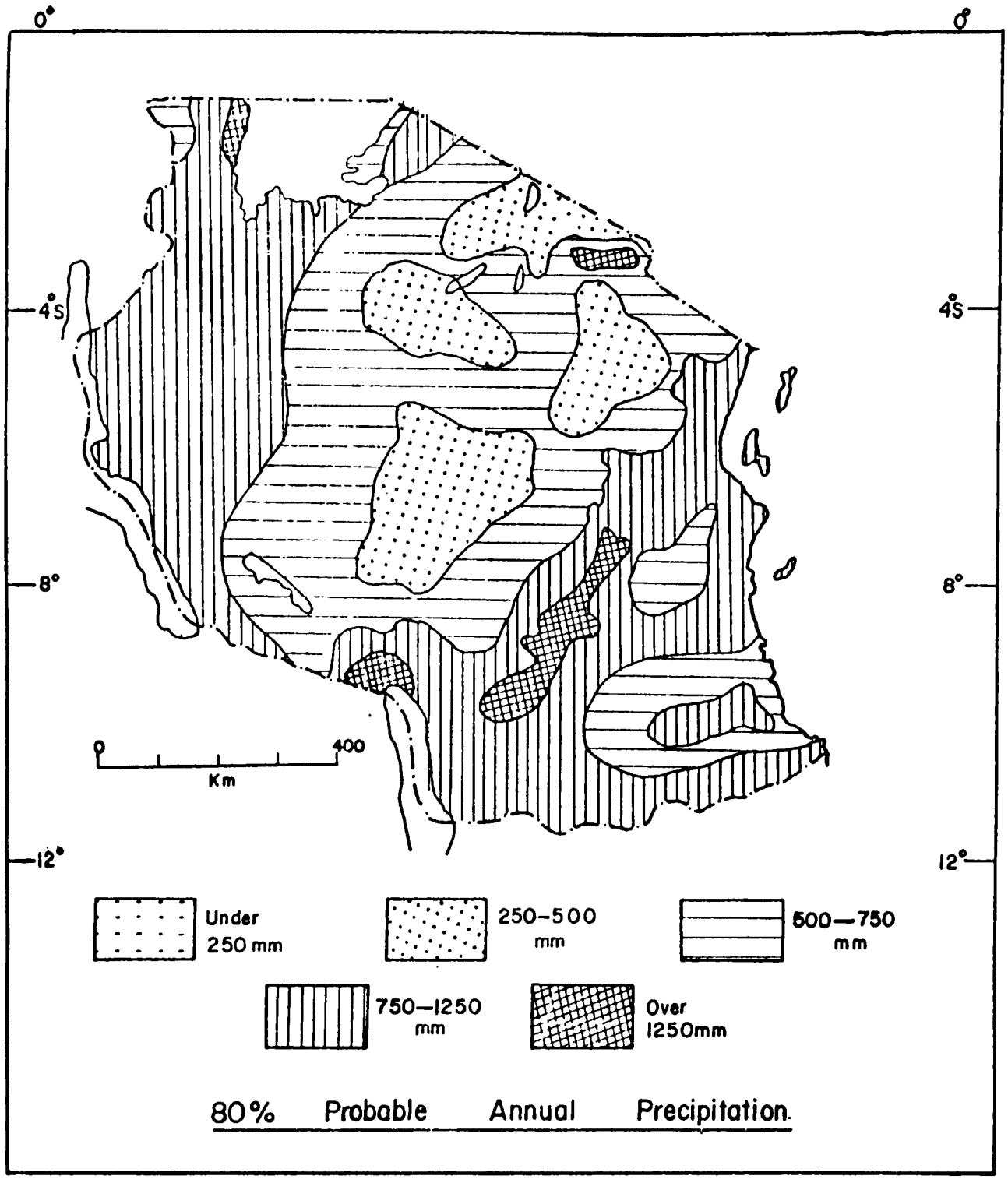
[26] Curry, J.R., 'Eleusine Cultivation by the Wachagga on Kilimanjaro', EAAJ 4, (March 1939), 386; van Rensburg, H.J., 'The Role of Pasture Development in Soil Conservation, Tanganyika Territory', EAAJ 13, (July 1947), 23; Peat, J.E. and A.N. Prentice, 'The Maintenance of Soil Productivity in Sukumaland and Adjacent Areas, Tanganyika', EAAJ 15, (October 1949), 49; van Rensburg, H.J., 'Land Usage in Semi-arid Parts of Tanganyika', EAAJ, (April 1955), 247

[27] Swynnerton, R.J.M., 'Some Problems of the Chagga on Kilimanjaro', EAAJ 14, (January 1949), 119; Lunan, M. and J. Weir, 'Maize-Growing at Ismani, Iringa, Tanganyika', EAAJ 20, (October 1954), 93; Macartney, J.C. and M. Dagg, 'Equipment Modifications to a Mechanized Tied-Ridge System of Cultivation', EAAFJ, 34, (July 1968), 153

[28] Gillman, C., 'Geographical Notes on Tanganyika Territory', Vol. II, RH Mss. Afr., (1928-33), 48; Hutchinson, H.G., 'Extension Aspects of Beef Cattle Management in Tanganyika', EAAFJ, 30, (January 1965), 265; McCulloch, B., 'Overstocking in Sukumaland Tanganyika', EAAFJ, 30, (January 1965), 221

[29] Keen, 'Presidential Address', 7

Map III.1: 80% Probable Annual Rainfall



Source: Nieuwolt (1978), 209

APPENDIX IV: AGRICULTURAL ZONES

Gillman identified five main types of land occupation and associated agricultural patterns: 1) the land islands of high rainfall based on banana cultivation; 2) the alluvial plains and scarp-foot fan settlements based on rice or other annual staple crops; 3) the cultivation steppe based on agro-pastoralism with cattle and millet; 4) the highland-savanna, dry-savanna and coastal hinterland settlements where shifting cultivation of maize, millet and cassava is practiced; and 5) the areas of nomadic occupation, where pastoralists follow the rains.[1]

Several decades later, Iliffe devised a classification of Tanzanian peasant agriculture that was based on different forms of commodity production.[2] Three zones were identified: the export crop-producing areas, primarily of coffee and cotton (corresponding to Gillman's first and second zone); the labour-reserve areas providing migrant wage labour for the coastal plantations (mostly Gillman's zone 4, but also some of Gillman's Zone 1 population in the more remote Southern Highlands around Mbeya and Iringa); and finally, the interstitial areas producing food for sale to the plantations and other non-food producing concentrations. The plantations which so dominated the Tanzanian economy in the inter-war period were located in Gillman's Zone 4 coastal-hinterland. Since these areas were fairly sparsely populated, labour had to be supplied from other areas.

Conyers devised a classification of 16 zones of rural land use broken down further into 46 sub-groups based on geographical area and food and cash cropping pattern. Geographically, it is similar to that of Gillman, but the proliferation of zones arises from her use of cash crops as a main classification criterion.[3] Conyers' 46 sub-groups come close to delineating Tanzania's diverse farming systems and are the basis for establishing district food cropping zones in TABLE II.1.

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[1] Gillman, Population Map, 357

[2] Iliffe, J., Agricultural Change In Modern Tanganyika, Historical Association of Tanzania Paper No. 10, East African Publishing House, Nairobi, (1971), 30

[3] Conyers, D., 'Agro-Economic Zones of Tanzania', BRALUP Research Paper No. 25, (1973)

APPENDIX V: INCIDENCE OF FAMINE BY AGRICULTURAL ZONE

1. Banana Cultivation of the Highland Zone

Food shortages are least likely to occur in the highland zone due to the higher rainfall and the heavier reliance on cashcrops, notably coffee. In Kilimanjaro, food shortages have been extremely rare, save for in the drier Rombo district where farmers resort to specialization in finger millet for beer brewing and seek wage labour in other parts of the mountain during times of scarcity.[1] While drought is less frequent, altitude does not afford escape from locust; migratory locust were responsible for food shortages in the Usambara mountains in 1927, 1933 and 1944.[2] As population pressure becomes more acute, size of holdings shrinks. In the Usambaras, cropped area per family has declined over time. In the Mlalo Basin in 1947 the average family holding was 1.38 ha, whereas in the late 1970s only about 25% had over 1 ha.; many less than a half ha.[3] As household holdings contracted, bananas were replaced successively with potatoes, maize and then cassava because of environmental depletion and expansion into new areas not suited to other food crops. In Kilimanjaro and Bukoba, there has been a tendency for population to spread out into the drier plains where the bananas are replaced with maize as the staple. Food risks increase.

2. Rice Cultivation of the Floodplains

Many river valleys are relatively underpopulated because of the catastrophic flooding that occurs, especially in their upper reaches. The Rufiji delta area, however, is densely populated and since the mid-1930s has experienced food shortages about one in every three years.[4] The extension of land under cultivation and deforestation have been blamed for an increase in run-off and consequent

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[1] Swynnerton, 'Some Problems of the Chagga', 123,126

[2] Brooke, 'Types of Food Shortages', 341

[3] Fleuret, P. and A., 'Nutritional Implications of Staple Food Crop Successions in Usambara, Tanzania', Human Ecology 8(4), (1980), 311-327; Iliffe, Modern History, 350

[4] Brooke, 'Types of Food Shortages', 347

rise in flood levels over the past fifty years.[5]

The disastrous flooding of 1968 led the government to relocate the valley's residents in villages on the plateau; the first area to be 'villagized'. Bantje argues that this has in fact heightened the incidence of food shortage in the upper reaches, where increased distance to fields has made it difficult to protect crops from animals and led to smaller plots as more time is taken up in commuting between home and field.[6]

Historically, migration out of the district in search of food has been a very common famine response. In 1940, an estimated 50% of upstream householders were temporarily absent.[7] The area has always had a close association with Dar es Salaam and food appeals tend to be directed as much at urban as rural relations. The impassability of the roads during the rains has often been an impediment to effective famine relief. Over the decades, Rufiji district has been subject to de-population. Migration to Dar es Salaam being the major drain.

3. Millet and Maize Agro-pastoralism of the Cultivation and Semi-cultivation Steppe

Agro-pastoralism is widely practiced in Sukumaland, Mbulu and the drier semi-cultivation steppe area of Dodoma and Kondoa. Cattle lend an additional margin of safety against food shortage, as they can be slaughtered for family consumption or otherwise sold when the need arises. But cattle overstocking has often been identified as the reason for soil erosion, environmental degradation and ultimate increased liability to food shortfall.

In Sukumaland (Shinyanga and Mwanza), the 1940s was a decade of severe food shortages. Mounting

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[5] Savile, A.H., 'A Study of Recent Alterations in the Flood Regimes of Three Tanganyika Rivers', EAAJ 11, (1945); Bantje, H., 'The Rufiji Agricultural System: Impact of Rainfall, Floods and Settlement', BRALUP Research Paper No. 62, (1979), 28-29

[6] Bantje, 'Rufiji Agricultural System', 2,35

[7] Bantje, H., 'Flood and Famines, A Study of Food Shortages in Rufiji District', BRALUP Research Paper No. 63, (1980), 12

population pressure and fears of environmental deterioration led to the implementation of the Sukumaland Development Project. From the mid-1950s to the mid-1970s, Sukumaland was relatively free of food shortages.[8] Food shortages have been acute recently, due to poor weather and the depradations of the scania weevil. Farmers prefer to over-sell their maize, rather than take their chances storing it.[9]

Crop failures have been frequent in Mbulu and Kondoa district, both of which are areas experiencing over-stocking and hemmed in by tsetse fly. Maize is the main staple. Wheat was encouraged as an alternative staple by colonial authorities in Mbulu after World War II, but it has developed more as a cashcrop than food crop.[10]

Severe food shortages and famines have become a way of life for the Gogo semi-pastoralists of Dodoma, Manyoni and Mpwapwa districts.[11] There is scarcity of food in some part of Gogoland almost every year. Rainfall is very low and unreliable (TABLE 2.2).

Colonial authorities were quick to notice that Gogo acreages were too small to afford them adequate grain for household consumption. Colonial efforts to make Gogo raise their agricultural production included: the requirement that each taxpayer place half a bag of grain in a tribal famine reserve and minimum acreages of one acre per adult, half an acre per child. A viable cashcrop

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[8] Brooke, 'Types of Food Shortages', 350

[9] Kavishe, F.P., 'A Safari Report on the Food Crises in Central Mwanza and Shinyanga Regions', TFNC Report No. 883, Project 15, DSM, (1984), 1-14; Paula Park, Oxfam, personal communication, November 1984

[10] Kjaerby, 'Agro-Pastoralism', 31

[11] Brooke, C., 'The Heritage of Famine in Central Tanzania', INR, 67, (1967), 15-22; Mbogoni, L.E.Y., Labour Migration and Famine in Dodoma District, B.A. History Dissertation, UDSM, (1977); Ndorobo, B., 'Famine Problems in Dodoma District', Journal of the Geographical Association of Tanzania 8, (1973); Patton, M. 'Dodoma Region 1929-1959: A History of Famine', BRALUP Research Report No. 44 (1971); Rigby, P. Cattle and Kinship among the Gogo, (Ithaca, Cornell University Press, 1969)

suitable to the semi-arid climate of Dodoma has never been found. Over-sale of food crops is common.[12]

Trading cattle for grain in the surrounding districts has been the usual first response to food shortfall. Thiele argues that such cattle sales have had a differentiating effect on households, leaving some households without any cattle and forced to seek wage labour. Following World War II, Gogo increasingly resorted to migrant wage labour on sisal plantations, the Groundnut Scheme, and on the commercial maize farms of Iringa's rich peasants during the 1950s. More recently, in the aftermath of villagisation, village differentiation has occurred and Gogo from less well-endowed villages work on the farms of more prosperous neighbouring villages in exchange for grain or in those villages close to Dodoma town engaged in commodity production destined for urban sale, e.g. charcoal production, tomato cultivation, etc.[13]

Latham's nutritional survey of Dodoma and Kondoa in the second year of a famine (1962/63), showed a rate of only 9.2% protein calorie malnutrition in under-fives and the number of other signs of malnutrition were not much greater than in other parts of Tanzania free from famine conditions. He attributed this to the timely distribution of famine relief.[14]

4. Maize and Millet Shifting Cultivation of Woodland and Wooded Grassland Areas

Woodland and wooded grassland of the east, south, southwest and west cover over two-thirds of the country, most of it tsetse-infested. The population density is low, especially in Tabora and

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[12] Thiele, G., 'State Intervention and Commodity Production in Ugogo: A Historical Perspective', Africa 54(3), (1984), 96

[13] Thiele, 'State Intervention', 101; Sachak, N. 'Creating Employment Opportunities for Rural Women: Case Study of Dodoma Rural District', BRALUP Workshop on Women's Studies and Development, Paper No. 6, (1979), 5

[14] Latham, M.C. 'A Clinical Nutrition Survey of Certain Areas of the Dodoma and Kondoa District of Tanganyika', East African Medical Journal 41(2), (1964), 76; Mwaluko, E.P., 'Famine Relief in the Central Province of Tanganyika, 1961', Tropical Agriculture 39, (1962), 163-168

Rukwa where large tracts of land were completely unpopulated until recently. Maize is the major staple, although it is not suitable for some of the drier areas. Some districts, notably Handeni in Tanga region, have recurrent famine approaching the Dodoma-syndrome. Records of food supply in Bagamoyo for 34 years under British colonial rule reveal five years of famine, nine years of moderate to severe food shortage and eleven years of unsatisfactory food supply.[15]

Peasant responses to food shortage are similar to other regions. In some areas, cashcropping helps to tide people over in lean years. This is especially true of the cashewnut production of the south. In Tanga, many men have resorted to working in the sisal plantations. Drought-resistant cassava is grown extensively especially in coastal and southern areas, although it has been persistently rejected in Handeni where droughts are frequent because it is felt that the year-round nocturnal vigilance needed in protecting it from wild pigs and baboons is not worth the effort.[16] Finally, bush foods, wild fruits and roots are eaten in this zone more than any other because of their abundance.[17]

5. Pastoralism

The largest group of pastoralists, the Maasai, inhabit the rift valley in Arusha region. Other small pockets in Coast, Tanga, Dodoma, and Singida are inhabited by a related group of pastoralists, the Baraguyu. Both the Maasai and Baraguyu have practiced fairly pure forms of pastoralism in the past with a diet primarily of milk, blood and meat. Recently, however, amongst the Maasai, maize has become an important part of the diet for many, sometimes household-grown, but more often purchased, and can now form up to 50% of the diet. This change is attributed to a shortage of grazing land and

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[15] Bryceson, D.F. 'Colonial Famine Responses', Food Policy, (May 1981), 97

[16] Brooke, 'Types of Food Shortages', 345

[17] Sumra, 'Changes in Agricultural Practices', 14

cattle diseases causing a shortage of milk.[18]

Kjaerby records the same process of increasing reliance on maize amongst the Barabaig of Northern Tanzania, but dates its origin as far back as the 1930s when drought and trypanosomiases killed off a large number of cattle at the same time as pressures of population growth were being experienced. Cattle per capita declined from 4.3 in 1934 to 2.3 in 1965.[19] Pastoralism is suited to arid environments and famine relief has been infrequent historically. Nonetheless, as pastoralists have become more reliant on maize, food insecurity has arisen from the inadequate and sporadic supply of maize meal in the local shops. During the droughts of the mid-1970s onwards, pastoralists have not been as easily availed of famine relief as cultivators because of the long distances to distribution points and the unsympathetic response of the local bureaucracy whose ethnic connections are with the cultivating tribes.[20]

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[18] Arhem, K., K. Homewood and A. Rogers, 'A Pastoral Food System: The Ngorongoro Maasai in Tanzania', BRALUP Research Paper No. 79 (1981) cited in Petit, A. 'Report of a Nutrition-Status and MCH-Coverage Baseline Survey in Nainokanoka Ward, Ngorongoro District, Arusha Region, Tanzania', Oxfam (1984), 3

[19] Kjaerby, 'Agro-Pastoralism', 55-58

[20] Kjaerby, 'Agro-Pastoralism', 74

APPENDIX VI: FAMINE RELIEF

At the outset of British colonial rule, a serious famine raged in the central part of the country. The effects of the scorched earth tactics and general insecurity of the war were compounded by drought. Food and transport availability were seriously constrained. District officers had to administer to peasants' food appeals with little assistance from central government.[1]

Since the formalisation of state famine relief procedures in 1930,[2] famine relief has been dispensed primarily through the agency of the state, although over the last two decades international aid agencies such as the Red Cross and the Catholic Relief Services have been directly involved as well. Official famine relief policy has remained remarkably uniform.[3] Local government bodies, the Native Authorities during the colonial period and village government and party officials more recently, have been used to identify needy households.[4] Stress has been continually placed on refraining from free handouts of food, except for the old and infirm. Everyone else has been expected to pay for famine relief food, albeit at subsidized prices, at the time of issue or at the

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[1] Bagshawe, the District Officer in Kondoa records having to muster his own famine relief supplies by sending porters out to purchase food through a voucher system. His administrative tasks were enormous with the enlistment of porters, payment of the food vouchers and the issuing of famine relief to hundreds of famine victims. Missionaries helped in the relief operations. He recounts: 'Amongst the troubles of an officer dealing with famine may be encountered hungry porters who broach their loads (especially women who can't be strafed), others who simply clear home with it, highwaymen who cut off stragglers, children abandoned by their parents who crawl between your feet and pick up mealies in the dirt and eat them raw, wives whose husbands have left them, liars, people who are too lazy to help themselves, people who are too feeble to go for food, and the Political Department at Dodoma' (Bagshawe diary, 21/4/19, RH Mss Afr.s.28).

[2] Bryceson, D.F., 'Changes in Peasant Food Production and Food Supply in Relation to the Historical Development of Commodity Production in Pre-Colonial and Colonial Tanganyika', Journal of Peasant Studies 7(3), (1980)

[3] TT, Circular No. 33 of 1930, 'Famine and Famine Relief', TNA SMP 13252; Sessional Paper No. 1 and 2 of 1943, 'Famine Relief' and 'Famine Finance', PRO/CO852/428/17630; Prime Minister's Office directive on famine relief, 1977 cited in Sunday News, 15/5/77

[4] The Catholic Relief Services of Tanzania is the one exception to this, using the territorial network of Catholic clergy in addition to government channels to obtain information on needy areas (Catholic Relief Services of Tanzania, 'The Tabora and Shinyanga Regions Drought Relief Program Field Implementation Plan', mimeo, DSM, (1984), 2).

next harvest. Frequently, payment has been through labour contributions on public works, such as road, dam and water supply construction, specially instituted during the famine.

However, in the event of dire need, the policy has been to dispense free food. Dire need has been defined as an absence of food stores, livestock or cash to buy food. This has been a matter for the dispensing officer to determine through general enquiry and, if need be, household checks. The actual identification of needy households has been subject to variation in implementation over time due to changes in context and personnel. During the colonial period, procedures sometimes went so far as to require famine relief recepients to have a sponsor, usually a village headman, who knew them personally and could vouch for their need; the sponsor's name as well as that of the food recepient were recorded.[5]

It is highly probable that the bureaucratic professionalism surrounding famine relief issue in combination with the foreign aloofness of the colonial officer resulted in more targetted distribution than was possible during the post-colonial period when dispensing officers had a stronger identity with the locality and undoubtedly faced stronger soliciting from famine victims. Mkunduge reports that the inter-village distribution of famine relief in Gairo, Kilosa district in the mid-1970s was not based on a need criterion and was delivered irregularly by the National Milling Corporation under the direction of the Prime Minister's Office.[6] Within the villages, food was issued to livestock owners and well-off peasants as well as the poor; the ostensive reason for this being that there were no staple foods available for purchase in the local shops.

Famine relief statistics are disparate and it is difficult to piece together territorial totals. TABLE VI.1 provides official famine relief tonnage for the period between 1975/76 and 1981/82.

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[5] E.g. Dudbridge, B., 'Report on the 1949/1950 Famine in the Maswa District', RH Mss. Afr.s.880, 5

[6] Mkunduge, G.L.M., Aspects of Famine Relief in Gairo Division, Kilosa District, M.A. Thesis, UDSM, (1976), 39,51

Deaths from famine sometimes occurred during the colonial period. In 1929, an estimated 500 people perished from starvation in Bugufi due to the late detection of famine conditions by the district officer.[7] The 1943/44 drought in Dodoma resulted in an estimated 200 deaths.[8] Fatalities were averted in the 1961 famine, which was very widespread and particularly acute in Dodoma.[9] I have not encountered any reports of deaths in the post-colonial famines of the mid-1970s and early 1980s. Over the past 60 years, the relative absence of famine-induced mortality has probably contributed to the rise in the population growth rate.

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[7] Letter from E.K. Lumley, Assistant District Officer, Bugufi to Chief Secretary, 6 August, 1930, TNA SMP 13252

[8] TT, 'Report of Famine Accounts', Dodoma District Book

[9] Mwaluko, E.P., 'Famine Relief in the Central Province of Tanganyika, 1961', Tropical Agriculture 39, (1962), 163-168

TABLE VI.1: NMC FAMINE RELIEF ISSUES 1972/73-1980/81, (Metric Tons)

Year	Amount	Locations
1972/73	28,769	n.a.
1973/74	2,114	n.a.
1974/75	86,501	n.a.
1975/76[1]	50,321	n.a.
1976/77[1]	24,394	Dodoma, Singida, Arusha, Tabora, Rufiji, Iringa, Morogoro
1977/78[1]	17,621	Dodoma, Singida, Iringa, Monduli, Handeni, Masasi, Rufiji, Lindi
1978/79[1]	1,689	Dodoma, Iringa, Kilosa, Handeni, Kyela, Lindi
1979/80[1]	13,175	Dodoma, Singida, Lindi, Handeni, Kyela
1980/81[1]	6,718	Mara, Iramba, Handeni

[1] Early Warning and Crop Monitoring figures for 1975/76-1980/81 differ somewhat from the above:
(metric tons)
1975/76 - 58.8
1976/77 - 24.5
1977/78 - 17.5
1978/79 - 1.0
1979/80 - 14.6
1980/81 - 3.9

Sources:
1972/73-1975/76 - Tanzania Food and Nutrition Centre, 'Data Report on the Food and Nutrition Situation in Tanzania', (1982) Table 21.21
1976/77-1980/81 - Prime Minister's Office, DSM
1975/76-1980/81 - Tanzania, Ministry of Agriculture, 'Tanzania's Cereal Import Requirements for 1981/82', EWCMP, FAO/KILIMO, DSM, (July 1981), 10

APPENDIX VII: RAIL AND ROAD TRANSPORT POLICY, 1919-1973

Colonial policy favoured the long-distance transport of goods by rail in preference to more expensive road transport. Three major factors gave rise to under-utilization of Tanganyika's rail system during the interwar period: commercial production was restricted in the main to a few hundred settler enterprises, peasants were hardly producing for any long distance markets; the Depression's price slump caused stagnation in commodity production; and rail rates were not competitive with alternative railings through Kenya, causing a haemorrhaging of Tanganyikan goods from the territory.

While the first factor, it could be argued, was a matter of long-term developmental change, and the second arose primarily from international forces beyond the control of the colonial state, the third factor, was directly attributable to state policy, specifically its position regarding free trade with Kenya. Non-official Legislative Council members castigated the government for its complacency over agreements with Kenya that were highly detrimental to Tanganyika. In 1923, the Kenya-Uganda railway system was allowed to open up and operate the defunct Kahe-Voi line that had been used for British troop supply during World War I (MAP 2.3). In so doing, Tanganyikan goods were deflected from the Tanga line and routed to Mombasa port. Similarly, one of the conditions that the Tanganyikan government conceded when procuring the loan capital to build the Tabora-Mwanza line[1] was that ton-mile rates for goods destined for Dar es Salaam could not under-cut those of Kenya's Kisumu-Mombasa line.[2] Since the distance between Kisumu and Mombasa was 290 kms shorter than that between Mwanza and Dar es Salaam, it attracted a larger portion of the Lake region's traffic, notably that of Bukoba and Musoma. It was only in 1937 that the Tanganyikan government put Mwanza-Dar es Salaam rates at a par with the Kisumu-Mombasa line.[3]

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[1] Opened in 1928.

[2] H. Jamal and Chitale, Legislative Council Proceedings, (LegCo), 5th Session, Part I, 15/1/31, 115-116; Chitale, LegCo, 8th Session, 6/11/33, 34

[3] TT, Tanganyika Transport: A Review by J.R. Farquharson, Chief Engineer, Tanganyika Railways and Ports Services, (DSM, Government Printer, 1945), 55-56

Tanganyika Railway's utilization was remarkably low in contrast to both African and non-African comparisons. The problem of spreading overhead costs over very light tonnages and effecting a balanced railways budget, led to considerable retrenchment and cost-cutting during the Depression as well as differential rates between categories of goods aimed at optimizing revenue but avoiding disincentive effects on export commodities.[4] Thus the highest rates were placed on imports, e.g. peasants' cloth piece goods. Domestic trade goods fell in a middle-range, whereas rates on export crops bound for the port were kept as low as possible.[5]

With a view to balancing the railway budget, the state adopted a policy of strong rail preference, charging high road tariffs in an effort to preclude any resort to road transport where rail was available.[6] Road transport at 6 d per ton-mile was considerably more expensive than rail's one and a half to one and three quarters d average per ton-mile, making it best suited to short hauls or for transport in the Southern areas where there were no railroads.[7] Thus the development of commodity production in any area was greatly hampered by the absence of a rail outlet, and the Southern Highlands was a prime example of this. Despite its suitable climate and soils, its agricultural enterprises repeatedly floundered.

After 1950, railroad investment was primarily restricted to marginal extensions for the existing main lines.[8] More importantly, in 1963 a line was completed to connect the Central and Tanga lines.

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[4] Between 1931 and 1932 there was a 43% drop in revenue and a 40% cut in railway expenditure (General Manager, Tanganyika Railways, LegCo., 7th Session, 4/11/32, 136).

[5] General Manager, Tanganyika Railways, LegCo., 7th Session, 4/11/32, 134

[6] Acting Chief Secretary, Road Tolls Bill, LegCo., 5th Session, 5/5/31, 25: General Manager, Railways, 'Carriage of Goods by Motor (Prohibition) Bill, LegCo., 8th Session, 11/4/34, 225

[7] General Manager, Tanganyika Railways, LegCo., 8th Session, 11/4/34, 225

[8] In 1950 a 131-mile branch line was opened off the Central Line to Mpanda. In 1958 a branch line to Masasi was added to the Southern Province Railway but in 1962 the whole of the Southern Province Railway closed down. In 1960 a 44-mile branch line was built off the Central line from Kilosa to Mikumi to facilitate traffic from the Southern Highlands.

In 1970 construction of a Tanzania-Zambia Railway began which was to provide the Southern Highlands with its long-awaited rail access.

Road development concentrated on creating an integrated system of trunk roads with north-south connections between the main east-west arteries and attempted to make the most important of these all-weather roads. After independence, a rural feeder roads improvement programme was initiated. Despite the improvements in the road network, high transport costs continued to constrain marketed food production from the Southern Highlands.[9]

Long-distance road transport over the trunk roads was primarily in the hands of large transport firms. In 1967, the two largest firms, EAR&H Road Services and Teeteeko, accounted for 7 per cent of all vehicles and 9 percent of overall tonnage of commercial goods transport. Twenty-five percent of total tonnage capacity in the country belonged to the 17 largest transport firms with more than 10 vehicles each, while the remainder was mostly that of small transport operators with only one or two vehicles.[10] The inauguration of the Transport Licensing Authority in 1957 led to the distinction between public carriers authorized to transport goods commercially and private carriers who could only transport goods for their own shops and businesses. Since the public carrier's license was considerably more expensive, there was a great deal of abuse of the private carrier category, creating unfair competition for the public carrier. In 1962, the law was changed and private carrier's licenses were restricted to one of four demarcated zones of the country, depending on the geographic location of the licensee's business. State regulation of road transport continued throughout the 1960s and early 1970s.

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[9] During the mid-1960s, transport costs on wheat to Dar es Salaam from Sumbawanga amounted to 27% of the end price. To encourage Sumbawanga wheat production, in 1967, approximately one-third of the transport costs were subsidized out of NAPB funds (Hofmeier, Transport, 201-202).

[10] Of the 17 firms only four were not completely owned by non-Africans, namely the EAR&H Road Services, a public corporation of the three East-African governments, Teeteeko owned by several co-operatives, the Tanzania Transport Co., with 40% African partnership and Coretco, an African transport cooperative (Hofmeier, Transport, 155-157).

APPENDIX VIII: NATIONAL MAIZE PROJECT

A national maize production programme developed alongside villagisation. In 1971/72, the newly formed ujamaa villages received free agricultural inputs and tractor ploughing services from the government in an effort to quickly establish collective socialist maize production as an alternative to that of the Ismani 'capitalist' peasant farmers. The following year a Tanzania Rural Development Bank project worth TShs. 1.8 million was initiated for the communal farms of 30 villages to cover the costs of improved seeds, fertilizers and tractor ploughing. But the net results were not encouraging. The average yield on the communal farms was a low 595 kgs/ha whereas peasants were achieving 869 kgs/ha on their private plots. Mohele attributes this difference to a shortage of efficiently organised labour on the communal farms.[1] Furthermore, the maize crop's response to fertiliser was not promising. Less than 5% of the farmers in the area were accustomed to using fertiliser. The communal farms' returns from maize sale would have covered only 32% of the total debt. After much pressure the villagers pledged to repay approximately 16% of the debt. The programme was henceforth discontinued.[2]

Undeterred, the government launched the National Maize Production Programme in 1973/74. Aimed at assisting newly formed villages, it involved the free distribution of improved inputs in 13 regions, using the cooperatives as distribution agents. It experienced input delivery problems, lack of motivation on the part of the extension staff and research data proved inadequate for the formulation of valid planting recommendations in different areas.[3] The programme was replaced by the

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[1] Mohele, A.T., 'The Ismani Maize Credit Programme', ERB 75.2, (1975), 9

[2] Mohele, 'Ismani Maize', 3-23

[3] After decentralisation, agricultural extensionists were directly accountable to regional government rather than the Ministry of Agriculture which limited the possibilities for technical up-dating of their advice to farmers.

World Bank-funded National Maize Project (NMP) in 1975.[4] The input packages were somewhat refined, involving the introduction of three graduated input packages into suitable maize growing areas in ten regions.[5] The packages were initially offered with a 50% subsidy to be reduced over time. The project was administered by a central project servicing unit within the Ministry of Agriculture.

At the conclusion of the first phase of the NMP in 1979, 859 villages, (roughly 10% of Tanzania's villages), had participated but the results were far from encouraging. Yet again the extension services performed badly. Expensive inputs had been applied where rainfall was too low, soils unresponsive or already adequately fertile. Often the inputs had been delivered late. Peasants' labour time constraints and crop prioritisation frequently led them to disregard the recommended input application procedures. Repayment of the loans, all of which had no interest charges was nonetheless riddled with default.[6]

The programme was revamped. The number of regions covered was reduced to the six most suitable regions for maize production in the country. In view of the problems experienced in credit recovery as well as the fact that if the provisioning of inputs was to continue credit could no longer be interest free the Tanzania Rural Development Bank (TRDB) was given responsibility for the programme. Input delivery continued to be extraordinarily difficult, especially at the time of the war with

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[4] IBRD, United Republic of Tanzania Appraisal of the National Maize Project, 897a-TA, Annex 6, (1975), 1

[5] The input packages were: 1) improved husbandry and the use of composite seeds to increase yields of maize (assuming a base yield of 1100 kgs/ha) by 400 kgs.; 2) the use of triple superphosphates and sulphate of ammonia fertilizers with the use of hybrid seeds rather than composite seeds in high altitude areas to increase yields by an additional 700 kgs/ha, totalling 2200 kgs/ha; 3) additional usage of sulphate of ammonia fertilizer and further replacement of composites with hybrids to maximize yields at 2700 kgs/ha. The regions were: Arusha, Dodoma, Iringa, Kilimanjaro, Mbeya, Morogoro, Rukwa, Ruvuma, Tabora and Tanga.

[6] Fortmann, L., 'An Evaluation of the Progress of the National Maize Project at the End of One Cropping Season in Morogoro and Arusha Regions', USAID/Tanzania, 1976, 8-21; Due, J.M., Costs, Returns and Repayment Experience of Ujamaa Villages in Tanzania, 1973-1976, (University Press of America, Inc., Washington, D.C., 1980), 101; Daily News: 'Maize project faces problems', 17/12/77; 'Poor research fails maize plan in Arusha', 3/2/78; 'TRDB loan terms are too severe', 17/3/78; 'Peasants "don't want" fertilizer', 20/1/79

Amin's Uganda.

At the completion of the project in 1982, approximately 50% of the TShs. 51 million loans and interest accumulated between 1975 and 1980 were unpaid.[7] The project's total costs were estimated at TShs. 307 million ($38.1 million) apportioned between: the IDA (47%), the Tanzanian goverment (29%), the Arab Bank for Economic Development in Africa (13%) and the farmers (10%). The project's visible impact was concentrated in Ruvuma and Mbeya where marketed maize more than doubled and in Rukwa where it quintupled (TABLE 6.8). Yields in Rukwa were recorded as high as 4 tons/ha. Overall, however, yield increases were disappointing. It was estimated that average yields had increased to 1500 kg/ha as opposed to the 2700 hoped for.

Clearly, there was need for refining the technical package, tailoring it for various local soil and weather conditions, which would require painstaking research and extension work. Furthermore, the technical package had to be adjusted to better suit peasants' cash and labour budgets. The transition from financially unencumbered subsistence production to production bearing financial investments and risks was at the root of the peasants' inability to repay loans. When peasants took credit for capitalisation of their production the returns to peasant labour were jeopardised even though the potential for increased output was greater. A peasant operating on a very small scale with family survival at stake often bore risks that were higher than his/her potential gains and the unreliable input delivery and crop purchasing system introduced an additional risk element.

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[7] Interview with Mr. Urasa, Director, National Maize Project, 26/12/83; Urasa, 'National Maize Project Report', mimeo (December 1983); Bryceson, D.F., Second Thoughts on Marketing Co-operatives in Tanzania, Plunkett Development Series 5, (1983), 23-27; Daily News: 'TRDB Loan Recovery: Legal Organ Proposed', 5/1/81; 'TRDB stops loans to maize growers', 13/1/82

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